



Curriculum Units by Fellows of the Yale-New Haven Teachers Institute
2010 Volume I: Interdisciplinary Approaches to Consumer Culture

Environmental Consumerism

Curriculum Unit 10.01.03
by Larissa Giordano

Introduction

I teach fourth grade at Nathan Hale School in New Haven, Connecticut. My fourth grade classroom is composed of a diverse, multicultural community of learners that encompasses a wide spectrum of achievements, interests, learning and social needs. As mentors and role models for children, we should not only teach academic subjects but help students understand who they are and why certain things happen to them and their environment.

This multidisciplinary unit includes lesson plans designed to enhance literacy, history, math and science as it guides students' understanding of what consumerism is and how, environmentally speaking, their lives are affected by it. The term "consumerism" is used in several different ways. In economics it usually refers to a movement promoting the rights and safety of the consumer that arose in the early 1900s as people grew increasingly concerned about consumer safety and the toll taken on factory workers by manufacturing methods. Early consumer boycotts by organizations like the Women's Consumer Leagues were aimed at improving working conditions though they would often point to infected or adulterated goods as a way to move consumers to protest. As a result of movements like these, the government now sets regulations and laws for the protection of the consumer.

Additionally, the term consumerism describes a way of life in which people place high value on material possessions, and in which people tend to consume more than they need. This push to buy often tends to blur one's vision when differentiating among needs and wants. Counter to this, there is also the social consumerism movement that looks at the effects of consumption on society. This important concept must be taught to students so that they, too, can understand their role as consumers: how to differentiate between needs and wants and how to appreciate the impact of these decisions not only on their financial security but also on the environment.

This unit focuses on consumerism's effects on the environment. Students will investigate how consumerism in the second sense, is so much a part of them as individuals that it can lead to waste and environmental havoc. Students will recognize themselves as consumers and take responsibility for their consumer choices, such as whether to use paper, plastic or to bring their own cloth bags when shopping. They will examine the natural resources that our Earth provides and how overconsumption can leave us with depleted reserves of energy unless alternative sources are used. Students are then expected to use this knowledge to make informed

decisions, knowing that every choice counts in the effort to sustain our environment.

Objectives

The consumption of goods has become over time the centerpiece of our culture. Only by producing and selling things and services can our modern economy thrive. The more that is produced and the more that is purchased, the more we have progress and prosperity. The gross national product (GNP), the traditional sum total of goods and services produced by a given society in a given year, measures consumption via economic growth. Although this is used as an indicator of our economic policies, it is not a flawless, magical calculation. The gross domestic product (GDP) on the other hand, is currently the most widely used measure of economic activity, focusing mainly on market production. This measure is often misconstrued as a measure of economic well being, when in fact it may not always indicate how well off people really are at a particular moment and can then lead to poor policy decisions as society's living standards are constantly evolving. (Fitoussi, Sen and Stiglitz, 2010, 24)

Consumption, although necessary for the economy, can also be hazardous to the environment. Students will identify the production, processing and consumption of commodities from the conception of a good to its disposal. These processes require the extraction and use of natural resources like wood, ore, fossil fuels, and water. They also require the creation of factories that often create toxic byproducts. Even the uses of the commodities themselves create pollutants and waste.

Specifically, this unit will identify the effects and consequences of a consumer culture and modern trends within our environment. It will answer questions like: What is a consumer culture? How do my daily decisions affect the future? What changes can I make in my own life to sustain our environment? The students will understand the life cycle of trash, particularly the consequences of using plastic versus paper. Students will look at the production, advertising, packaging, toxicity and cumulative impact of the environmental damage caused in the process. By the end of the unit, students will be able to answer the question, "Does our way of living cast an enormous dependence on commodities that are damaging to the Earth to produce?" Students will then devise multiple ways to help conserve our resources and to challenge the idea that more is better by understanding the differences between needs and wants.

This unit will be taught over a five-week period. Week One will focus on what consumerism is, its history and how it affects us personally as consumers. Students will learn to discuss the differences between needs and wants. Students will examine how advertising is used to target an audience and used to make the consumer feel as if he/she needs that particular item to be happy. They will also design their own pamphlets to advertise a consumer good that they identify as a need.

During Weeks Two and Three students, will look at a broader aspect of consumerism and identify its effects on the environment. They will understand that not only are they personally affected by their choices but that their choices have an environmental impact. Students will read and discuss the life cycle of trash and its journey from production to landfill. Students will understand what natural resources are and note the difference between renewable and nonrenewable. Student activities will include indentifying what that they can do to decrease waste through reuse and recycling. Student activities will include making their own paper.

Week Four will teach students alternative sources of fuel. They will experiment with growing their own fuel

and noting the environmental benefits of biofuel. Students will compare its economic cost to long-term environmental concerns.

During Week Five students will need to apply what they have learned in order to design an eco-friendly poster and letter campaign to the maker of a commonly consumed good, urging the company to take the environment into consideration during their production and manufacturing of the product.

By means of this in-depth look at consumerism and its application to daily decisions, students will begin to examine their own choices such as choosing reusable fabric bags over plastic at the grocery store or simply creating compost piles as a way to both reduce landfill waste and to reduce the use of pesticides, therefore diminishing land, air and water pollution. Students will understand the impact our consumer-driven economy has on the environment. They will be able to differentiate necessities from superfluous things and begin to make some changes to reduce the impact that buying has on the environment.

Consumerism, Consumer Culture and Consumer Society

It is vital to understand the differences between Consumerism, Consumer Culture and Consumer Society. Consumer society generally refers to a practical, even measurable state of economic development when a society and its economy can be said to be organized around and driven by marketplace consumption; the term generally refers to an ensemble of social institutions like the division of labor, mass production, and mass communications, advanced advertising and promotional institutions.

Consumer culture describes the patterns of values, meanings, and emotional satisfactions associated with those practices: the verbal, visual, and performative scripts through which goods, services, and experiences are promoted, ritualized, and dramatized.

Consumerism can refer to the frequency and intensity of marketplace behavior in an advanced capitalist society a society of high consumption. It can also refer to the high valuation placed on the satisfactions of consumption in a particular society, as in shop-till-you-drop. It can also name the different social movements calling for the reform of consumer society and culture; such as (a) the protection of consumer from shoddy or adulterated goods or for the purpose of this unit, (b) the environmental movement.

A Historical look at Consumption

Consumption, a practice that began 10,000 years ago when people started to change from a hunter-gatherer existence and settle in villages on a quest to improve their lives. It is what we all want. Although all societies consume to sustain themselves, consumer society refers to a socio-economic order where consumption is the focus. During the 1930's the United States endured a great industrial overcapacity and large numbers of unemployed workers. People grew accustomed to living modestly. According to Pollution Issues, "To break people of their habit of under consuming, American industry purposefully organized to encourage North America to become a throw-away society and embrace a consuming way of life." In order to keep the

economy going, things needed to be consumed at an increasing rate. (Pollution Issues, 2010) The 1950's marked an era of economic prosperity in the United States, complete with advertising, retailing and consumer credit where mass consumption helped bring shape to the economy and politics. In some respects, consumer society seems to have been deliberately constructed.

Media also helped industry persuade people that material goods would fulfill the void in their lives. Television, for example, has played such a successful part in consumption that American society has consumed as many goods and services between 1950 (when commercial television was launched) and the mid-1990s than all previous generations combined. (Pollution Issues, 2010)

Mass marketing flooded television programming from family entertainment shows and sports to commercial jingles designed specifically to target certain audiences. Even now, according to Juliet Schor, the "United States remains the most consumer oriented society in the world. People work longer hours than in any other industrialized country. Savings rates are lower. Consumer credit has exploded and roughly a million and a half households declare bankruptcy every year."(Schor, 2004, 9) This is partly due to our more than 46,000 shopping centers and our desire to acquire record amounts of stuff to store in our walk-in closets and four car garages. Americans also have approximately one television set per person per household, and we are continually inundated with images of consumer products advertised specifically to capture our attention and fill our void in our quest for happiness. Twentieth-century consumers are encouraged to look upon consumption as the bridge to a fulfilling and rewarding life. There is an underlying yearning for more, not only because of the way it is marketed but because it is often thought that more is better. A trip to the shopping mall means "more stuff" and to many, this excess is part of the hunt for a better life. (Schor, 2004, 9)

Filling the Void

Often we think if we can just have that one special item then we'd be happy. Whether it is food, clothes, housewares, gadgets or even cars or large houses, consumption is thought to bring happiness and fill a void. Many citizens seek social status and define their self-worth in terms of the quality and quantity of their personal possessions.

The accumulation of goods is a defining characteristic of a consumer lifestyle. "It is often remarked that even the average person in the world's wealthy consumer societies enjoys greater personal comfort and convenience, if not outright wealth, than European monarchs of only a few centuries ago." (Pollution Issues, 2010) This search for immediate gratification comes with consequences, especially in areas, with large populations of people who constantly want the biggest and the best of everything. Filling the psychological void requires resources. These resources are manufactured, packaged and marketed to promise happiness, yet ultimately they all come from and return to the environment. In our search for happiness, it can be useful to distinguish between our needs and our wants.

Lesson Plan #1 Needs versus Wants

Introduction: Every individual has a different idea about what separates a "need" from a "want," depending on his or her culture, background, values, and situation. Although every person has different ideas about what is necessary for him or her, there are certain basic needs that all humans share, including biological needs (food, water, air, shelter); social needs (clothing, feelings of belonging and protection); and spiritual needs (faith, love, hope). Students should begin as a whole group discussing their own personal needs and wants and how they define these categories. Students will take an in-depth look at themselves as consumers and ask themselves what makes them buy certain brands. They will ask themselves questions like: Why do I need to buy a particular brand of boots or a certain style of jeans or wear tee-shirts and sweaters made only from a particular store.

Following this discussion, students will learn that these choices have economic, social and environmental consequences. Students will then learn to make responsible consumer choices that reduce waste and save natural resources.

Objectives: Students will recognize the impact of humans on natural systems. Students will make predictions about the impact of certain behaviors and how personal or cultural perspectives affect these behaviors. Students will assess factors that affect consumer purchases and recognize that responsible consumer choices can result in reduced waste and environmental impact. Students will also analyze the substance of Dr Seuss's *The Lorax* is a children's book that chronicles the plight of the environment and the Lorax who speaks for the trees against the greedy Once-ler

Materials: *The Lorax* by Dr.Seuss, Chart Paper, Reflection Worksheet: Needs and Wants- Create a worksheet using the following questions. 1. Why did the Once-ler cut down the Truffula trees? 2. Why do the Brown Barba-loots have to leave? 3. What kinds of problems does the thneed factory cause for the environment? Name at least three. 4. What happens to the Once-ler when there are no more Truffula, trees? 5. What happens to the Lorax? 6. Is bigger always better? Give an example to back up your opinion 7. A "Thneed" is defined as a fine thing that everyone thinks they need. What are some examples of the thneeds in our lives that we think we need? 8. If you were the Once-ler, what would you have done differently to protect the environment? 9. Write your own ending to the *Lorax* starting after the word UNLESS...

Needs and Wants Game Pieces: Create flash cards on cardstock of the following words. Television, Dollars, Air, Milk, Home, Eggs, Car, Warmth, Parents, Friends, Sun, Rain, Quiet, Medicine, Computer, Nuts, Electricity, Bicycle, Grass, Clothes, Water, Candy, Fruit, Yard, Insects, Vegetables

Procedures: Introductory Discussion: What are some of the consequences of producing lots of trash? Students should recall how it smells, because everything we throw away was originally made from a natural resource. Although some waste will eventually biodegrade, it is not true for all waste. It also costs us money to get someone to come to our house and take our trash away. Generally, the more trash we generate the more we pay to dispose of it. Then read *The Lorax* by Dr. Seuss. Discuss the following questions in the reflection section as a whole group. Finally, break into groups of 4 or 5 and have the students complete the reflection worksheet.

Reflection/Response: 1) How did each step of the Once-ler's developing business destroy a piece of the ecosystem until the entire system ceased to function? 2) Why was the Super Axe Hacker invented? 3) Why did

the Once-ler ignore the Lorax's warnings? 4) What happened to the Lorax? What did the Lorax's message "UNLESS" mean? 5) What are some of the environmental consequences of living in a culture with a lot of wants?

Needs and Wants Game Instructions: Directions: 1) Copy the Needs and Wants Worksheets so that each pair of students will have a set. Create a set of needs and wants flashcards on cardstock. 2) Divide the students into pairs. Pass out one envelope of cards to each pair. Direct them to sort their cards into piles that are alike in some way. Ask the students to explain which "rule" they used for sorting the cards. (List the rules the students used on the board). 3) Have students put the cards back into the envelopes, then discuss what is the difference between a need and a want. Can you live without the things you need? What about the things you want. Now tell them to resort their cards using this criteria. Ask students to define the standards they used to decide if something is a need or a want. Students might offer answers such as cost, parent/legal permission, personal safety, peers, etc. 4) Lead a class discussion on basic needs for life and how that might differ from culture to culture. Teach students how affluent societies tend to have more "needs" although they really are wants because of their lifestyle, but that many of these things are not really necessary. 5) Have students make a list of things that they have recently purchased or been given. Write an N or a W next to each item. Have students reflect on the things that they personally own such as toys, electronics, clothes, recreational gear. Ask them to write down examples of things they have more than one of such as shoes, jackets, games, stuffed animals. Underline the items that you could do without if you had to and circle the items that you would always want to have. Discuss how students can assess whether or not they have "enough" and how they might find other ways to be happy without accumulating new things all the time and without creating more garbage. Also, you might help students think about the money they and their families can save by foregoing unnecessary purchases. By only buying what we need, we are freeing up our own monetary resources for a better use like a saving for the future, or the purchase of a more expensive item that will last a long time. Examples of alternatives to our "wants" are: building or creating art or toys for yourself; exchanging one toy for another with a friend or group of friends; going to the library and check out books on new subjects to learn new interests and skills rather than purchasing them at the bookstore. (Teacher's Resource Guide for Solid Waste and Recycling Education, 1999)

Filling the void may produce moments of happiness, but its long-term effects can be both economically and environmentally damaging if not monitored closely. The economic production process often creates a larger amount of waste than the actual product. The packaging, distribution, use, and consumption of the product produce more waste. Waste becomes pollution when the level of contamination changes and destroys the quality of the atmosphere, water, soil, or landscape. As consumers, we tend to pay the most attention to pollution when it affects our own health; however it is evident that waste and pollution are inevitable by-products of a consumer society, and so this aspect of the consumer lifestyle deserves some attention. (Pollution Issues, 2010)

Consumption affects the environment in many ways. High levels of consumption require high levels of production, which in turn requires large amounts of energy and materials. These materials, in turn, generate large quantities of waste byproducts. An increase in the extraction of and exploitation of natural resources as well as an overwhelming amount of accumulating waste pose a serious threat to our environment. In the long run, degradation of our environment will also limit economic activity.

Today's consumption means "grand scale pollution, waste mountains, energy shortages, land degradation, water deficits, even climate upheavals." (Myers and Kent, 2004, 5) We all contribute to these problems. Traffic congestion, pollution, and energy shortages are affected simply by our need to have a car on the road. This

need is partly due to deliberate policies that encouraged suburbanization while discouraging mass transit. Our present consumption patterns are unsustainable. Over half of all available freshwater has already been consumed and looking ahead to an increase in world population, by 2020 water supplies will be in even greater demand and available in more and more limited quantities. We are also consuming much of the Earth's net plant growth. Approximately twenty million square kilometers of land have already been degraded. (Myers and Kent, 2004, 5)

Our Carbon Footprint

Two major threats to the environment lie in pollution and the squandering of living and nonliving resources. Because the United States, with only five percent of the world's population uses up over a quarter of the global resources, our ecological footprint is greater than any other nation's. This footprint is measures how much of the Earth's resources are used to support our lifestyle and to absorb the amount of waste produced. The choice of food, transportation, housing, types and amounts of energy usage and refuse disposal are some of the factors that determine the size of the footprint. If every person on the planet lived like the average American, we would need the materials from four Earths to sustain them. (Vogel, 2003, 83)

Lesson # 2: My Ecological Footprint. How does the way we live affect the Earth?

Overview: In this classroom activity and discussion, students are made aware of the finite amount of resources on Earth and how population and daily choices affect what is available for others. Students will calculate their own Ecological Footprint (a measure in hectares of Earth's resources used) and how this Footprint compares to their classmates'. Students will also determine which of their daily choices have the most effects on the amount of resources they consume, and will create a ranked list of actions they can (or will) take to reduce the size of their footprint.

Objectives: Demonstrate an awareness of the global implications of decisions that individuals and families make about their needs and wants. Describe the impact of leisure and career choices on family life. Identify environmental and health issues related to the production and consumption of food. Explain the environmental impact of economic activity, population growth, urbanization, and standard of living. Explain contemporary concepts of sustainability. Assess the compatibility of human activities and population growth with concepts of sustainability.

Introduction: A discussion with students that includes information about (1) how all living things use the Earth's resources in varying amounts and (2) how humans are only one species of about 30 million resource-consuming species on the planet . Which of Earth's resources do we use to support our lives? Are these resources evenly distributed around the world? What do you think an "Ecological Footprint" is?

Activities: (1) Introduce definitions and provide some background information (20 minutes) "Ecological Footprint" (EF) is how much of the Earth we use for our food, clothing, play, energy, shelter, waste, etc.

Ecological Footprints can be calculated for an individual, for a family, for a city, or for entire countries. EF calculations are simply estimates or an inventory of how much of the Earth's renewable and non-renewable resources we use. When humanity's Footprint exceeds the amount of renewable resources available, a draw-down in natural capital is required and this is considered unsustainable. Global Footprint analysis indicates that over the last 40 years or more, humanity's cumulative Ecological Footprints appear to have surpassed Earth's ecological limits; this is not sustainable in the long term. At our current consumption rate, there is not enough Earth to meet our demands! We live in an era where there is an imperative to shrink our Ecological Footprints. (2) Work through the student exercise (questionnaires below) to calculate personal Ecological Footprints. Emphasize that these calculations will provide an estimate of how much of the planet we use. It is not a judgment of good or bad lifestyles; it is simply a value-neutral tool that allows us to objectively obtain a snapshot of how much of our resources are being used. (3) Discuss results of Questionnaires and explore concepts. Students can share calculations and create a class graph that displays results.

(Student Handout to calculate ecological footprint.)

WATER USE

Choose one:

If your shower is usually 1-2 minutes or your bath is $\frac{1}{4}$ full, you get +40

If your shower is usually 3-6 minutes or your bath is $\frac{1}{2}$ full +60

If your shower is usually more than 10 minutes or your bath is full, you get +80

Add up your Water Use Subtotal:

CLOTHING USE

If some of your clothes were bought brand new for you or by you, you get +10

If about $\frac{1}{4}$ of your clothes are second-hand or hand-me-down, you get -10

If some of the clothes that you often wear have been mended or fixed, you get -10

Add up your Clothing Subtotal:

WASTE

If you have repaired something this week that might have been thrown out, you get -5

For each that you fully recycle give yourself -5 points: newspaper; office paper; cans; hard plastic; plastic bags; glass; old clothes; batteries; motor oil from the car; cardboard, boxboard

Choose one:

If all your garbage on a typical day would fit into 1 garbage can, you get +120

If all your garbage on a typical day would fit into a basket, you get +90

Choose one:

If you really try to avoid using "disposable" items (e.g., pens, cameras, drink containers), you get -5

If you do not avoid disposable items, you get +20

For each dollar you spend on a typical day, give yourself +1.

Add up your Waste Subtotal:

ENERGY USE

If you always turn off the lights and other electrical appliances when you leave a room, give yourself -20

If you keep the house temperature cool in winter and wear a sweater, give yourself -20

Choose one:

If all your light bulbs are energy conserving bulbs, give yourself -20

If some of your light bulbs are energy conserving bulbs, give yourself -10

Choose one:

If you usually spend more than an hour on the computer and/or watching TV per day, you get +70

If you usually spend less than an hour on the computer and/or watching TV, you get +40

If you don't usually spend any time watching TV or at the computer, you get no (0) points

Add up your Energy Subtotal:

TRANSPORTATION

If you usually spend some time on your bike on a typical day, you get +5

If you usually spend some time of the day on a public transport (bus or ferry), you get +30

If you usually spend some time carpooling (travelling with others in their car), you get +50

If you usually spend some time walking to where you're going, you get no (0) points!

Add up your Transportation Subtotal:

FOOD

If you grow a lot of your own food, you get -10 points

Choose one:

If you compost your fruit and vegetable waste, you get -10

If you do not compost, you get +30

Choose one:

If you usually throw out about $\frac{1}{2}$ your food, you get +100

If you usually throw out about $\frac{1}{4}$ of your food, you get +40

If you make sure you never waste food, you get no (0) points.

Add up your Food Subtotal:

Now add up all your Subtotals. Total = _____

Divide by 100 (e.g. 527 becomes 5.27) = _____. This is your Ecological Footprint (Hilderling, 2006)

Consumption; What have we done?

The United States is responsible for a disproportionate amount of the total consumption of key products and materials. We use one-third of the world's paper, even though we represent only five percent of the population. We also use twenty-five percent of the oil, twenty-three percent of the coal, twenty-seven percent of the aluminum and nineteen percent of the copper. (Brower and Leon, 1999, 5) Even when compared with other wealthy industrial countries we come out on top. The average American consumes twice as much fossil fuel (coal, oil and natural gas) as the average citizen of England and two and a half times more than the average Japanese. When it comes to waste, the numbers worsen. Americans discard nearly a ton of trash per person, per year. This number is two to three times the amount the average European produces.

Where does my trash go?

Garbage is something that humans have always produced and have always needed to get rid of. Americans produce more trash than we know what to do with. Garbage is often dumped, burned or recycled. We are a wasteful society with nearly 200 million tons of waste produced each year. Consumers throw away enough tires to encircle the Earth three times, ten million computers and one point six billion ball point pens.

Some of these findings were a result of a garbage analysis done in the early 1970's. (Tammemagi, 1999, 63) This analysis, known as 'The Garbage Project' excavated and cataloged the contents of eleven United States landfills. Through the exploration we learned that municipal garbage generally consists of the following components. Fifty percent of the waste is paper, including packaging, newspapers, telephone books, magazines and catalogues. Paper, which we investigated earlier, is almost one hundred percent cellulose, a carbohydrate that is highly combustible. Nineteen percent of the landfills consist of miscellaneous items like construction and demolition debris, tires, textiles, rubber and disposable diapers. Thirteen percent is made of organic materials like wood, yard waste and food scraps. Ten percent of the waste consists of plastics, including milk jugs, soda bottles, food packaging, garbage bags and polystyrene foam. Six percent of the waste consists of metals including iron as well as aluminum and steel food and beverage cans while there was one percent glass made up of beverage bottles, food containers and cosmetic jars and one percent hazardous

materials like pesticides and household cleaners (Tammemagi, 1999, 63-67)

Based on these findings, a large fraction of the landfills contents is potentially recyclable since one half of the landfill consists of paper. The single most abundant item is newspapers, which comprise of about eighteen percent of landfill space, while eight percent of the total landfill volume consists of disposable diapers. Sixteen percent of municipal landfills also account for the co-disposal of sludge from sewage treatment plants, which in some cases can be used for fertilizer or fuel. (Tammemagi, 1999, 63-67).

Lesson Plan # 3: Where Does the Trash Go?

Introduction: Students define stewardship and commit to reducing the amount of trash they contribute to the world. Students talk to older family members about trash and recycling memories to determine if this is an old problem or a new problem. (Teachers of middle school grades may also want to use Susan Strasser's *Waste and Want: A Social History of Trash* which focuses on 19th century concepts and practices of stewardship and recycling in waste and want.)

Objectives: The students will define stewardship as the wise use of resources,

describe the process that trash goes through to landfill and recycle stations,

measure the amount of trash produced by the class in a week, interview family members about trash issues in the past, and make a commitment to reduce the amount of trash in the future. Students measure the amount of trash they produce in a week. They calculate the effect that has on the earth over time. Students make a commitment to reduce the amount of trash they produce.

Materials: Trash containers for the classroom, Construction paper, Star template, Bathroom scale Read-aloud copies of *Where Does the Garbage Go?* by Paul Showers and/or *Dinosaurs to the Rescue* by Laurene Krasny Brown and Marc Brown.

Instructional Procedures: Tell the students that you want to cut out some stars to hang around the room. Explain how wonderful and colorful the room will look when it is done. Use one large piece of paper for each small star so you waste at least 90% of the paper. On one sheet, don't even cut out a star, make a mistake in tracing the star and throw the whole sheet of paper away. While you are cutting, look to see if the students will object to your wastefulness. If they aren't saying anything, ask them if they think you are doing a good job. Write the student comments on a piece of chart paper.

Tell the students that you are not being a good "steward." Define stewardship again as the wise use of resources. Tell the students that the earth does not have unlimited resources and we have to take good care of things like the air, water, trees and plants. For example, the water we drink and use is the same water the dinosaurs drank and used. Aren't we lucky the dinosaurs used their resources wisely? Shouldn't we use resources wisely for people and animals in the future? Remind the students that it is everyone's responsibility to take care of the environment for the common good.

Read *Where Does the Garbage Go?* by Paul Showers and/or *Dinosaurs to the Rescue* by Laurene Krasny Brown and Marc Brown. Discuss the main idea from the book(s). Have students name the process that garbage goes

through. Write the steps on chart paper.

Ask the students if they think trash has been a problem for a long time. How long has it been a problem? When their parents were young? When their grandparents were young? When the colonists were settling? When the Native Americans were the only people here? Listen to their predictions and challenge them to find out by talking to their family members of different generations. Students will interview family members with attached interview questions listed at the end of this lesson.

Explain to them that the class is going to see how much trash it produces in one week. At the end of the week they will weigh the bags of trash. (As an alternative, weigh the trash each day and add the amount of trash from day to day.) Bring the classroom trash container to the lunch room so that trash is included in the total amount of trash produced in a week. Since food garbage will get smelly, weigh that garbage and let the custodian take it away each day.

At the end of the week, look at the trash collected. Ask students to propose ways to reduce classroom garbage: using the backs of papers before throwing away, make a box available for colored paper scraps, recycling, reusing containers and other things for art projects or storage. Weigh or calculate the week's garbage. The teacher can multiply that by the number of classrooms to get the total amount the school produces in a week. Calculate how much garbage the school produces in a year. Discuss where that garbage goes. Lead the students to recognize that they produce a lot of trash that becomes an issue for the environment. Tell the students that they have an opportunity to be philanthropists (review the definition of philanthropy): students make a personal commitment to reduce the amount of garbage they produce. Help them write personal goals on paper such as I will use the backs of all papers. I will recycle at home. I will teach others about the importance of being stewards for the environment. When the students return their homework, discuss the answers from the interviews. To assess students, students should design a chart to illustrate with the steps that the garbage goes through. (Fisher, learningtogive.org)

Family Interview: Ask people in your family the following questions. Parents and grandparents may have different answers. (1) What stories did you hear from your family about trash being a problem when you were young? (2) Was too much trash a problem when you were a child? (How long ago was that?) (3) Did you produce as much trash at your childhood house as our family produces today? Why or why not? (4) What kind of things were considered trash? (5) Did you recycle anything when you were a child? (6) When do you think that too much trash became a problem? (7) How do you think we should try to solve the problem?

Lesson Plan # 4: The Life Cycle of a Consumer Good

Introduction: The environmental impact on consumption differs per product based on production, use and disposal of. Every day we make choices like choosing paper or plastic- without truly understanding the process from conception to landfill. These choices can determine how much garbage is produced. As consumers, we typically see a product for only a short phase of its existence- that phase in which the product is useful to us. For example: we may purchase a non biodegradable styrofoam cup, use it for a hot beverage, and then throw it away. What is not often taken into consideration, however, is that the raw materials needed to make the cup are extracted from the natural environment and the manufacturing process or the transportation of the product often causes pollution. To get a sense of just how much garbage we produce and its financial and

environmental costs, we must consider all phases of a consumer product, from its origin to its disposal.

A paper milk carton can illustrate the entire life-cycle process: (1) harvesting wood, (2) making paper, (3) processing paper into a labeled container and filling the container with milk, (4) transporting the milk carton to the store where it is purchased, and (5) disposing of the empty milk carton. (For this lesson, students can save their milk carton from breakfast that morning, as provided by New Haven Public Schools) Students can create a life cycle chain that outlines the steps from product design to disposal.

Students need also to understand the following key vocabulary terms. Eco-consciousness: How one thinks about the entire ecosystem, including how the ecosystem is affected by the life cycle of a consumer product. To be eco-conscious is to select products and services that will result in less waste and use less energy. Ecosystem: "Eco" means how living organisms relate to their environment as a whole. A "system" is a group of parts interacting and interrelating together as a whole. Life Cycle: The total process of creating, using, and disposing of consumer products made from the earth's resources. Recycle: The reuse of a material for producing consumer products. Reuse: To use a product more than once.

Life-Cycle Steps- students use the steps to create a timeline or graphic organizer.

(1) All consumer products begin their life cycles with a dependence on the natural environment. Some form of energy is always required to extract the natural resources from the earth or its atmosphere. To produce fiber, trees must be grown and harvested. To produce plastic coatings, petroleum and natural gas must be extracted from the earth. (2) Raw materials are processed or refined. For example, wood fiber is processed into cardboard and natural gas is processed into plastic resin. Energy is required for the processing and refining. (3) Additional energy is required as processed or refined materials move through the manufacturing and assembly processes. (4) Consumer products are transported to stores (consuming additional energy) and are ready for purchase. Products remain at this stage as long as they are usable or repairable. (5) The product is no longer of use to us and we dispose of it.

It is imperative to consider that all products we purchase or use are dependent on energy resources before and after they come into contact with us. After the product leaves our hands, it can be used many times or recycled. Perhaps a new use for a product can be found by selling it at a yard sale or trading it with a friend. In doing this, it continues to serve a useful purpose.

Eventually, when repair or recycling is no longer possible, the product needs to be disposed of, which means the product or its parts are returned to the earth. Returning a product to the earth occurs when we bury garbage in a landfill, burn combustible materials to recover energy (air emissions and ash disposal), or compost materials (carbon dioxide, water, and "soil-like" materials). Choosing the best method of disposal will depend on the materials the product is made of and the options available at a specific location. We should choose the disposal method that has the lowest impact or least negative impact on human health and environmental quality.

Sometimes, a product that is convenient in the short run may use more energy or cause more disposal problems than a less attractive product. A product that is less expensive at the point of purchase may also have hidden costs in terms of high energy use or low potential for reuse. As consumers we should remember to look at the relationship between consumerism (what we buy) and the natural resources (that are used to design, transport and dispose of) the product when we make our choices. (Barber, 1993)

Conservation; What can we do?

Conservation is the act of conserving; decay, waste, or loss; preservation; official supervision of rivers, forests, and other natural resources in order to preserve and utilize natural resources to prevent depletion.

As consumers, we are faced with the challenge of achieving greater consumption as an economic benefit but without adversely affecting our environment. We must learn how to alter our lifestyles and reduce our ecological footprint to work toward a more sustainable rather than consumable future.

Not all consumption has the same impact on our environment. In order to effectively reduce environmental damage, we must acknowledge that some consumption of food, water, clothing and shelter is necessary for survival. Rather than eliminate consumption we should look at our patterns of consumption to understand whether or not we are consuming too much of certain products and whether these products can be produced, used and disposed of in less damaging ways. For example, if we look at the use of gasoline, we know that burning gasoline emits air pollutants and the greenhouse gas carbon dioxide. It is possible to look at alternative forms of energy to help reduce consumption rates. (Brower and Leon, 1999, 5-12)

Energy in Our Lives

"Energy is the capacity to do work or make something happen." (Walker, 2007, 4) Without energy we would not have life on Earth. It is used to cook food, heat buildings and help both humans and plants survive. Every machine including cars, computers, televisions and the factories that produce them run on energy.

Anything that has energy, people can use as an energy source. There are two types of energy sources: non renewable and renewable. Non renewable sources cannot be replaced once they have been used and will eventually run out. Fossil fuels such as coal, oil and natural gas are examples of non renewable resources. Renewable resources are continually replaced by people and nature. They are also used to produce alternative energy sources, such as solar, wind and hydropower.

Oil, coal and natural gas are limited and scientists believe that there is about one hundred years of oil and natural gas left and about two hundred fifty years of coal left. Due to a consistent increase in population, the demand for energy continues to grow. As we begin to run out of fossil fuels, they also become more expensive to use. Since most of the technology we use everyday such as vehicles, furnaces, and power plants are powered by fossil fuels. Eventually, we will need to switch energy sources in order to keep technology running.

As consumers it is increasingly necessary to look to alternative sources that can be replaced by nature for our energy not only because they are renewable but because they are better for the environment. Currently, fossil fuels are the most commonly used energy source. Burning fossil fuels is harmful to our health and to the environment. When fossil fuels are burned for energy, greenhouse gases like carbon dioxide are released into the air. Greenhouse gases trap the sun's heat in the atmosphere, which the vast majority of scientists believe can cause to global warming. If global warming continues, polar ice caps will melt and weather patterns will change causing floods, droughts and crop failure. Acid rain is another way that fossil fuels harm the environment. When raindrops absorb sulfur dioxide in the air before falling, it damages buildings, forests and

wildlife. (Walker, 2007, 1-9)

A commonly used energy source in the United States is known as biomass. Biomass is the name for all organisms on Earth and their waste. Biomass that is used for energy includes grasses, trees, plants, sawdust, woodchips, food scraps, animal waste and sewage. Biomass stores solar energy and converts it to chemical energy. When it is burned or turned into gasses or liquid fuels, energy is released. We can use this energy for heating, cooking, lighting, powering vehicles and producing electricity.

When biomass breaks down it creates a type of gas called biogas. Biogas contains methane, carbon dioxide and hydrogen gases. It burns cleaner and more efficiently and is used for heating, cooking and producing electricity. Biofuels are liquid fuels that are made from plants. Many biofuels can be used in place of gasoline and diesel to run our technology. There are five types of biofuel: methanol, butanol, biodiesel, ethanol and bio-oil. High oil prices and the drive for renewable energy have led to their development. (Walker, 2007, 1-15)

Lesson Plan # 5: Biofuels; Grow Your Own Fuel

Introduction: Biofuels are an important part of today's culture. Using biofuel as an alternative to petroleum-based fuel has numerous environmental, economic, and social benefits.

Objectives: Students will understand conversion of the sun's energy in plants through photosynthesis, the carbon cycle, and energy transformations; students will conduct their own experiments; students will calculate the leaf area index and crop growth rate for diverse plant species used in their experiments; students will participate in discussions on current and future energy needs and alternative energy sources.

Materials: Seeds: canola, radish, sunflower, soybean, etc., 8 - 1 gallon pots per group of 2-4 students, potting soil, microscope, lab balance, scissors, lab oven (or you can dry them at home the night before and bring into school) lab balance, graph paper, science journals to record their data.

Vocabulary to teach: Photosynthesis: The process by which green plants make carbohydrates such as sugar, using water, carbon dioxide, and sunlight.

Carbon cycle: The steps by which carbon (in the form of carbon dioxide) is extracted from the atmosphere by living organisms and ultimately returned to the atmosphere.

Leaf Area Index (LAI): An estimate of the size of the plant's photosynthetic system or in other words, the plant's light collector. This function is similar to that of a solar panel on a building. **Net assimilation rate (NAR):** The increase in carbon after losses due to growth and maintenance respiration are accounted for in the plant.

Background Information: Students should be familiar with the process of photosynthesis and respiration. Students should be familiar with the carbon cycle. Students should be familiar with using lab equipment such as a lab balance to determine weight.

Introduction: Students need an introductory lecture on photosynthesis and respiration prior to this lesson. Since the price of fuel is increasing due to the shortage of petroleum, countries worldwide are seeking alternative sources of fuels. One alternative source is biofuel, which is derived from the sun via green plants.

Green plants capture solar energy and collect carbon dioxide from the atmosphere and convert this energy into a stable chemical form. Instead of using solar panels to capture solar energy, plants use a canopy of leaves and stems to collect the sun's energy. The conversion of solar energy to chemical energy by plants is known as photosynthesis. During photosynthesis carbon from atmospheric carbon dioxide is reduced to carbohydrates. Carbohydrates are transported from the leaf, most commonly in the form of sucrose (table sugar), to the developing seed. In the seed, the sucrose is converted to oil. Oil is stored in the seed to provide energy for the growing seedling during the seed germination process. But this seed-based oil may also be collected and used by humans as vegetable oil, or it can be converted to biofuel. Plants differ in how they capture solar energy and convert it to oil. To pick the plant that is most efficient, we need to compare photosynthesis in different plants. Remember, photosynthesis is affected by temperature, light, and water. Students will grow three different species of plants to test and compare.

Activities: Divide the class into groups of two to four students. Brainstorm questions related to photosynthesis and the carbon cycle. Go over the following questions as a class to help students generate their hypothesis. What factors are critical for determining which plants should be used for biofuel production? Does the architecture of a plant affect how efficient a plant is at converting solar energy to chemical energy? What are some different plant architectures? While growing different plants what data should be collected?

First you will decide what your question is, generate a hypothesis, and develop your procedures. Select 3 different plants to use in this experiment and examine the seeds under the microscope. Draw the seeds to scale, record size and any other observations you measure, Calculate and record the average weight of the seeds for each plant. For each plant species, plant 8-10 seeds per pot. Once seedlings have germinated you will thin seedlings to 5 per pot. Place pots in warm, well-lighted environment. Water and fertilize as needed to support plant growth. Observe and measure plant growth, including stem height and leaf length and width.

Once your plants have shown sufficient growth, clip the leaves. Weigh them. Trace them on graph paper to calculate the Leaf Area Index (length x width) Dry the leaves for 24 hours then reweigh and calculate the difference. Students should understand that the stem height, leaf area index and size of the seed help determine which plant is best suited to produce oil that can be converted to biofuel. Students can then record their observation and develop their conclusion/ results in their lab report. It is important to have the students create a chart for their data to show the growth over time. This will help them understand that crop growth rate is also important in the development of biofuel.

Educated Consumer Choices

There are other cases however where the product is environmentally damaging but because it is used in such small quantities, it's not vital to focus on reducing its consumption. An example would be Lego blocks are made out of acrylonitrile butadiene styrene plastic, an oil-based product that can contribute to air pollution and global warming. Given the likelihood that these toys are reused and passed to other children over time, it is not as necessary to focus on eliminating the product because it is less likely to wind up cluttering landfills. On the other hand, steps to reduce landfill clutter may be as simple as comparing the use of a plastic, paper and fabric bags. (Brower and Leon, 1999, 5-12)

Paper versus Plastic:

The life-cycle of a paper and plastic bag from production to landfill: When it comes time to check out after shopping, should you use a paper bag or a plastic bag? Although it may seem like an easy choice, there are many details and inputs hidden in each bag. From durability and reusability to life cycle costs, there is much more to each bag than you may think.

Where do brown paper bags come from? Paper comes from trees. The logging industry is huge, and the process to get that paper bag to the grocery store is long and takes a heavy toll on the environment. First, the trees are found, marked and cut which results in massive habitat destruction and long-term ecological damage. Then, machinery comes in to remove the logs from what used to be forest, either by logging trucks or helicopters. This machinery requires fossil fuel to operate and roads to drive on which impacts the ecological chain in its former surrounding areas. Once trees are collected, it takes at least three years of seasoning before they can be used. More machinery is used to strip the bark, which is then chipped into one-inch squares and cooked under tremendous heat and pressure. This wood is then combined with a chemical mixture of limestone and acid, and after several hours of cooking, what was once wood becomes pulp. It takes approximately three tons of wood chips to make one ton of pulp. The pulp is then washed and bleached; both stages require thousands of gallons of clean water. Coloring is added to more water, and is then combined in a ratio of 1 part pulp to 400 parts water, to make paper. The pulp/water mixture is poured into a filtration system of bronze wires, leaving behind only the pulp. It is finally rolled into paper. (Dunn, 2008)

Along the way, energy inputs: chemical, electrical, and fossil fuel-based are used to transport the raw material, turn the paper into a bag and then transport the finished paper bag all over the world. When you're done using paper shopping bags, for shopping or other household reuses, they can be composted or they can be recycled in most mixed-paper recycling schemes if they haven't been thrown away. (Dunn, 2008)

If composted, the bags break down and go from paper to a rich soil nutrient over a period of a couple of months; if you throw them away, they will eventually break down over a period of many years. If you choose to recycle paper bags, then the paper must first be re-pulped, which usually requires a chemical process involving compounds like hydrogen peroxide, sodium silicate and sodium hydroxide, which bleach and separate the pulp fibers. The fibers are then cleaned and screened to be sure they're free of anything that would contaminate the paper-making process, and are then washed to remove any leftover ink before being pressed and rolled into paper, as before. (Dunn, 2008)

How are plastic bags made?

Unlike paper bags, plastic bags are made from oil, a non-renewable resource. Plastics are a by-product of the oil-refining process, accounting for about four percent of oil production around the globe. The biggest energy input from the plastic bag creation process is electricity, which, in this country, comes from coal-burning power plants at least half of the time; the process requires enough juice to heat the oil up to 750 degrees Fahrenheit, where it can be separated into its various components and molded into polymers. Plastic bags most often come from one of the five types of polymers: polyethylene in its low-density form (LDPE), which is also known as #4 plastic. Like paper, plastic can be recycled. Recycling involves re-melting the bags and re-casting the plastic, though, manufacturing new plastic from recycled plastic requires two-thirds of the energy used in virgin plastic manufacturing. The material however loses viability in the process of recycling which makes it hard to make new plastic bags out of old plastic bags. (McGrath, 1998)

By looking at overall energy, emissions, and other life cycle-related costs of production and recycling, one can

begin to understand the implications of choosing paper versus plastic. According to a , plastic bags create fewer airborne emissions and require less energy during the life-cycle of both types of bags per 10,000 equivalent uses -- plastic creates 9.1 cubic pounds of solid waste vs. 45.8 cubic pounds for paper; plastic creates 17.9 pounds of atmospheric emissions vs. 64.2 pounds for paper; plastic creates 1.8 pounds of waterborne waste vs. 31.2 pounds for paper. Plastic therefore has lower energy requirements. Both paper and plastic bags require lots of resources and energy. Proper recycling requires due diligence from both consumer and municipal waste collector or private recycling company.

Ultimately, neither paper nor plastic bags are the best choice. Reusable canvas bags are the way to go from an energy standpoint. Canvas bags are 14 times better than plastic bags and 39 times better than paper bags, assuming that canvas bags are used 500 times during their life cycle. (McGrath, 1998)

Reduce, Reuse, Recycle

The idea of "reduce, reuse, recycle" isn't necessarily a new vision of practice. It indeed was once a practical way of daily life that over the years may have been overlooked as we have evolved into more of a consumption driven society. Susan Strasser's *Waste and Want: A Social History of Trash* outlines the pragmatic ethic of stewardship in domestic households where women practiced the recycling of rags, the making of quilts and other re-use of materials as a part of housekeeping. These insights can bridge the historical gap by showing students where we were and where we are headed.

Reducing unnecessary product purchases is one way to reduce the consumption of resources. Another way to use fewer total resources is to purchase products that can be used many times. Recycling can change our buying habits and save precious resources and energy. Remember that what happens to a product before we obtain it and after we use it helps determine the product's cost and its impact on our environment. Our consumer decisions determine what wastes are produced and how they are returned to the air, water, and land. Is everything we throw away really garbage? This consumption of natural resources could remain plentiful if recycled. Of the eighty percent of iron and steel that is consumed, only fifty-five percent is being recycled. An average American consumes eighty times more paper than the average Indian and consumes two hundred, forty times as much gasoline. This, then, contributes to carbon dioxide emissions and global warming. Although consumption of natural resources often converts to human capital, the question remains as to whether consumption merely uses the resources or in fact uses them up. (Myers and Kent, 2004, 1-7) In an effort to keep natural resources like trees from being used one can make their own recycled paper.

Lesson Plan # 6: How to Make Your Own Recycled Paper

Recycled paper can be made from old newspaper, following the instructions below. Recycling paper uses cellulose (plant fibers) over and over again, it uses less electricity, less water, a lot less pollution, and it saves trees from being cut down! Materials: a food processor or an old blender, an electric iron an old wire hanger, an old pair of panty hose, newspaper or other paper, torn into 2-inch squares, white glue, water, an insect screen or strainer (optional), food coloring (optional), a big sink or tub filled with 4 inches of water. (1) Make a

frame out of the coat hanger. You'll need a frame for each piece of paper you make. Stretch the hanger and bend it into a rectangle/square shape. Take one leg of the panty hose and stretch it carefully over the hanger frame. Make sure it is tight and flat. (2) Put a handful of the torn up paper and some water into the food processor or blender. Blend the mixture on high until it becomes mushy. Keep adding paper and water until you have a big gray blob. You may have to add a little more water to keep things moving smoothly. Keep the food processor on until all the paper has disappeared. Then leave it on for 2 minutes. For some color, add a handful of brown or red onion skin (not the onion itself, just the papery outer skin). (3) Put 2 tablespoons of white glue in the sink water and add all of the paper pulp you just made. Mix it really well. Use your hands. (4) Scoop the frame to the bottom of the sink, and then lift it slowly. (Count to 20 slowly while you are lifting.) Let the water drain out for about a minute. (5) Hang the frames on a clothesline or put them out in the sun. Wait until they are completely dry with no dampness at all. You can then gently peel off the paper. (6) Use the iron, set on the hottest setting, to steam out your paper. You can keep making paper until the pulp is all strained out of the sink. Mix up the sink every time you make a new piece. Try adding lots of food coloring, for colored paper, or try adding lint or leaves to the food processor. (Lamb, 2002)

Every Little Bit Helps; What can I do?

While overconsumption is a major contributor to accelerating global warming, the situation is not hopeless. As human beings, we are consumers by nature and we have to consume to survive. We can, however, be informed consumers and learn to consume responsibly by making careful choices to reduce the negative impact of our lifestyle. "For example, the most ecologically harmful consumer activities are associated with fuel-guzzling private automobiles and light trucks, diets rich in industrially produced meat, poultry and other products of intensive agriculture, home heating and cooling (including water heating), modern appliances, home construction and household water/sewage. Personal transportation, food, and household operations alone account for between 59 and 80 percent of total household environmental impact in several categories of pollution and environmental damage." (Brower and Leon, 1999, 12)

Making educated choices and conserving natural resources are just part of what we can do to minimize consumption and protect the environment. When we decide to take public transportation, walk, or bicycle instead of drive a car, when we practice composting, reduce the amount of packaged goods we consume, and consistently reduce, reuse and recycle to diminish the amount of waste that occupies our landfills we increase the sustainability of the Earth's natural resources. We must also pay careful attention to goods that we consume based on their life cycles because as consumers, we make choices that affect the earth's natural resources including its energy supplies. Whether our choices have positive or negative effects may depend on our understanding of the consumer product life-cycle. So, before you buy a product, consider these questions: Have you read reliable sources of information about this specific product or service? Do you really need the product or service? If you had to, could you do without it? What is an alternative product or service? Does it have a lower life-cycle cost? How does this product or service compare in terms of: use of the earth's resources, use of energy throughout the product's life-cycle, performance, and life expectancy. What parts can be recycled? What is the cost of disposal and what is the environmental impact of disposal?

Appendix

Implementing District Standards

In accordance with the Connecticut Science Curriculum standards teachers must promote scientific literacy. Students will comprehend fundamental concepts from life, physical and earth sciences through critical thinking and an infusion of inquiry-based explorations and experiments. Students will create, validate, communicate and apply their scientific knowledge. Language Arts, Mathematics, Science and Technology will therefore be integrated throughout this unit while meeting the following state mandated and district standards. This unit will be integrated directly through science (natural resources including renewable and non renewable), social studies (history of consumerism, how it has changed and how these changes are consequently affecting our environment), math (value of money, graphing and data collection) language arts (reading and writing) and technology (research and creation of PowerPoint slides.) It is in accordance with the state and district curriculum inquiry standards that dictate students must know and describe how natural phenomena and some human activities may cause changes to habitats and their inhabitants as well as the necessity for conservation. It meets state standards: (BIO) 2.4 How do science and technology affect the quality of our lives? (Science) 4.2 All organisms depend on the living and nonliving features of the environment for survival. (Science) 5.2 Perceiving and responding to information about the environment is critical to the survival of organisms. Additionally, this unit is aligned with New Haven Public Schools goals for students which say "What students learn in school must be relevant to the world in which they live."

Annotated Bibliography

Barber, Shirley. 1993. Waste Education Series. <http://www.extension.umn.edu/distribution/naturalresources/DD5569.html> Accessed: July 15, 2010. This is a great website for teachers to retrieve background information on the life cycles of consumer products. It also gives great lesson plan and project ideas.

Brower, Michael and Leon, Warren. *The Consumer's Guide to Effective Environmental Choices*. New York: Random House, 1999. This guide provides useful information for teachers to share with their students about how to make environmentally friendly consumer choices.

Canham, Jennifer. *Try This at Home, Planet Friendly Projects for Kids*. Canada: Bayard Books, 2008. This is a great book to use to kick off your unit with your students by showing them eco-friendly ideas that are fun and useful.

Cartlidge, Chereese. *Alternative Energy*. Yankton: Ericson Press 2008. This children's resource gives information about energy at work: solar, nuclear, wind, water and biofuel.

Christenson, Karen. *Home Ecology*. London: Arlington Books. 1990. This text explores the various eco-friendly products you can make in your home for cleaning without chemicals. It also discusses water, energy and food conservation.

Dunn, Colin. *Paper Bags or Plastic Bags, Everything you need to Know*. 2008. Accessed: July 15, 2010. This website is run by environmentalists to give consumers information on how to make informed decisions.

Dupler, Douglas. *Conserving the Environment*. New York: Greenhaven Press, 2006. This teacher resource provides a series of articles

by scientists that have opposing viewpoints on what is best for conserving our environment.

Fisher, Debra. Trash: Past, Present and Future. Cleveland Public Schools. Accessed: July 15, 2010. This website develops lessons and resources that teach giving and volunteerism, civics and character through service learning.

Fitoussi, Jean Paul and Sen, Amartya and Stiglitz, Joseph. Mismeasuring Our Lives.

New York: The New Press. 2010. This text is written to show the inadequacy of GDP growth as an indication of overall economic health.

Hilderling, Jackie. Stream to Sea: What is your Ecological Footprint? 2006.

<http://www.heb.pac.dfompo.gc.ca/community/education/lessonplans/ecofootprint> Accessed: July 15, 2010. This website provides elementary and secondary school teachers with terrific eco friendly activities and background knowledge.

Kent, Jennifer and Myers, Norman. The New Consumers. Washington: Island Press, 2004. This teacher resource outlines the change in consumer trends throughout history. It shows how consumerism is economically and environmentally influential.

Lamb, Annette. Reduce, Reuse, Recycle 2002.

Accessed: July 15, 2010. This teacher website gives great ideas for teaching the necessity of "reduce, reuse and recycle" in your classroom.

McGrath, Jane. Which is More Environmentally Friendly? Paper or Plastic? 1998.

Accessed: July 15, 2010. This website examines the amount of environmental damage caused by the creation of plastic and paper bags from conception to landfill.

Pollution Issues, 2010. Accessed: July 15, 2010. This website gives teacher background information about waste and pollution.

Schor, Juliet. Born To Buy. New York: Scribner, 2004. This text describes how the marketing culture toward children tricks them into believing that what they buy defines them as persons.

Shah, Anup. 2005. Effects of Consumerism. Accessed: July 15, 2010. This is a great online resource that outlines, graphs and compares the rise in consumerism trends with that of landfill waste and pollution.

Strasser, Susan. Waste and Want: A Social History of Trash. New York: Henry Holt and Company, 1999. This work is an effective resource for adapting this unit for middle school students. It outlines 19th Century practices of stewardship and recycling.

Tammemagi, Hans. The Waste Crisis. New York: Oxford University Press, 1999. This book parallels the population growth and rise in consumption trends with the amount of garbage being produced from the conception of a good to the landfill.

Teacher's Resource Guide for Solid Waste and Recycling Education, 1999. <http://www.deq.state.or.us> Accessed: July 15, 2010. This website is a wonderful guide for environmentally friendly lesson plans and projects.

Vogel, Carole. Human Impact. New York: Franklin Watts, 2003. This is a student resource that shows children how to conserve water, energy and food.

Walker, Niki. Biomass- Fueling Change. New York: Crabtree Publishing Company, 2007. This is a student-friendly resource that shows them how to conserve energy by seeking alternative forms such as through biofuel and biomass.

<https://teachersinstitute.yale.edu>

©2019 by the Yale-New Haven Teachers Institute, Yale University

For terms of use visit <https://teachersinstitute.yale.edu/terms>