

# Stuff Curriculum and Resource Guide



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## **Introduction**

This curriculum package was developed by NEW BC, a nonprofit organization based in Victoria, British Columbia, to accompany a 1997 book by Northwest Environment Watch (now Sightline Institute) called *Stuff: The Secret Lives of Everyday Things*. As an approach to science, social studies and environmental education, this material has a simple premise: that young people are curious about their world. *Stuff* gives students the opportunity to explore their world in a new way. For example, students will be encouraged to think about and explore what really goes into their lunchtime french fries – where were the potatoes grown? What fertilizers and pesticides were used? How were the potatoes harvested and transported? How much energy was used in processing? How about the salt and ketchup? An entire web of connections and impacts is revealed behind those everyday items we normally don't even think about. In learning about their stuff, students will also explore new ways of looking at their world, making links between the environment, their society, and themselves.

## **View of Learning**

Students today are inheriting a confusing social and environmental legacy. On the one hand, as members of one of the richest consumer societies on the planet, they are told to buy more and to consume ever new and improved products. On the other hand, with increasing evidence of environmental degradation, they are confronted with an uncertain future and a world of increasing social and environmental problems. Students struggle to reconcile these powerful messages and to make sense of their own role as citizens and as consumers.

The intent of this curriculum package is simple: to give students the tools and framework within which to think about the consequences of consumption. We have avoided a dogmatic, prescriptive approach. Simply telling students to consume less is unlikely to contribute to their understanding or to affect their behavior. On the other hand, providing an approach to understanding the relationship between consumption and its consequences is interesting, relevant, and integrates a number of curriculum areas. We have attempted to create learning materials that support the development of thoughtful, critical, and imaginative students. The following briefly outlines the educational approach used in developing this package.

## **Educational Approach**

This curriculum package does not simply give students “the facts” on consumption and the resulting environmental impacts. Rather, the material is based on a view of learning that acknowledges the students' active role in the learning process. Students bring an understanding of the world and their place in it to the material. Through new experiences, new tools, exploration, discussion, reflection, and action, students build upon or revise their initial understanding. The teacher's role in this model is to help students make sense for themselves rather than telling them what they need to know. This active view of

learning has implications for curriculum materials and instructional methods, reflected in the development of this package:

- assess prior knowledge of students as starting point for learning;
- emphasize key concepts and tools rather than specific information and skills;
- allow for reflection, discussion, and questioning of concepts;
- encourage students to apply their learning in new ways and contexts;
- draw on primary data and real world examples;
- allow for group work when possible;
- integrate assessment throughout learning process.

Recent research on environmental education has identified four categories and a number of criteria for developing effective curriculum materials. We have addressed these criteria wherever possible in developing materials for *Stuff*. Following is a brief summary of this research, as well as references to the approach taken in this guide.

**Table 1.** Learning enhancement criteria divided into four main categories

Main Category	Criteria	Application
Close to daily life	<ul style="list-style-type: none"> <li>• Recognizable in daily life</li> <li>• Usefulness in daily life</li> <li>• First hand experience of phenomenon at stake</li> <li>• Connected to past experience</li> <li>• Reflection on past experiences (behavior, feelings)</li> <li>• Varied and diverse to accommodate the interests and abilities of the individual student</li> </ul>	<ul style="list-style-type: none"> <li>• everyday objects as the subject of exploration</li> <li>• direct relationship to students' daily habits</li> <li>• everyone consumes at some level</li> <li>• looking at everyday stuff allows room for diversity in interests</li> </ul>
Cognitively challenging	<ul style="list-style-type: none"> <li>• Cognitive dissonance leading to a rethinking of prior knowledge</li> <li>• Issue-based to handle controversial issues and to develop problem-solving skills and action competence</li> <li>• Theoretically deepening to enhance and broaden knowledge and understanding.</li> <li>• Discovery learning to</li> </ul>	<ul style="list-style-type: none"> <li>• students begin to question consumer habits and social values</li> <li>• issues of lifestyle and consumption are central to environmental problem solving</li> <li>• framework of product analysis and ecological footprint provide sound theoretical base for explorations</li> <li>• activities focus on</li> </ul>

	<p>enter new realms of experience</p> <ul style="list-style-type: none"> <li>• Intellectually challenging in that students need to raise their thinking and acting to a higher level</li> </ul>	<p>discovering the hidden and fascinating web that connects consumption with the environment</p> <ul style="list-style-type: none"> <li>• the complexity of relationships and issues around our stuff provides accessible and challenging materials</li> </ul>
Controversial	<ul style="list-style-type: none"> <li>• Social conflict to pique curiosity and to stimulate discussion</li> <li>• Socially acceptable or not too threatening for the community of which the school and the students are part</li> </ul>	<ul style="list-style-type: none"> <li>• questions the dominant consumer orientation of our society</li> <li>• allows for a range of reactions in response to learning</li> </ul>
Focused	<ul style="list-style-type: none"> <li>• Accurate observation using all senses</li> <li>• Action-oriented to develop action competence</li> <li>• Sufficient time to study issue in depth</li> </ul>	<ul style="list-style-type: none"> <li>• range of activities allows for scientific, hands-on approach</li> <li>• opportunities for action on the individual, school, and community level</li> <li>• designed with “fast track” and full approach for flexibility.</li> </ul>

Source: Wals, Arjen E. J. & Tore van der Leij. 1997. *Alternatives to National Standards for Environmental Education: Process-Based Quality Assessment*. Canadian Journal of Environmental Education. Volume 2.

### **A Sense of Hope**

The other criterion that we have used to inform these materials is hopefulness. All too often, students are given a bleak picture of the state of the environment. Without the tools to address these problems, they can seem overwhelming, leading to fear and paralysis rather than reflection and action. While the information presented in *Stuff* can be depressing at times, the overall message of the book and of this curriculum package is hopeful. Students are empowered with the knowledge that their decisions can make a difference and that there are simple, positive steps they can take to a more healthy planet.

## Lessons and Activities

### Module A: Introduction

This module introduces students to the key concepts discussed and developed throughout the unit. Your students deal with stuff in many forms every day but most of it goes relatively unnoticed and unquestioned. This first module aims to get students noticing stuff and beginning to question its origin and its place in their life and their world. By looking at the stories of things their secret lives many issues can arise: environmental, social, economic, technological, historical, and cultural. This module in particular, and the unit more generally, allows and encourages students to explore the full range of questions and connections. Many of the issues do not have simple answers, but by encouraging dialogue and giving students some frames of reference to think about their stuff, they will learn much about their world and their place in it.

#### A-1 Warm-up Quiz

Intent: A warm-up quiz to spark the interest of the students and to provide a sense of their initial understanding of some of the concepts.

A jumping off point for an opening discussion of issues and concepts that will be covered in the unit. Focus on raising questions and issues rather than answering them.

Time: 50 minutes (or 1 period)

Resources: Copies of *Stuff*, notebook, and pen or pencil.

Approach: Start with a general introduction to the unit. Hand out copies of *Stuff* with quiz on the back. Individually or in small groups, allow students about 5 minutes to answer the questions. (NOTE: the answers are also provided on the back of the book parallel to the spine.) Use the remaining time to discuss answers, pose questions, and enter into an open discussion about stuff, consumerism, and waste.

Here are some additional questions to generate discussion (try not to answer these questions for the students, but allow them to discuss and debate the issues). Encourage your students to formulate their own questions about stuff.

- Which fact from the quiz do you find most surprising? Why?
- Brainstorm a list of stuff that you use during the course of a day.
- Where does your water come from? Where does it go?
- Where does your lunch come from? Where does it go?
- Where does your garbage go?
- How could we find out more about our stuff?

Link: For the next lesson, ask students to think about and to estimate the amount of garbage they produce every day (in weight). In posing this question, ask students about

what they consider garbage – is it just the stuff that ends up in their garbage can? Are there other ways they contribute to producing garbage that are less visible?

## **A-2 Your Weight in Stuff**

Intent: To help students make a personal and tangible relationship with the issues covered in *Stuff*. To initiate student reflection on their own impact as consumers and to begin to consider ways to reduce their impact. To introduce the notion of cumulative impact where each individual action is compounded and multiplied by the population.

Time: 1 period

Resources: Copies of *Stuff* – prologue.

Approach: Start with a discussion of students' estimates of the garbage they produce every day. How did they arrive at these estimates? Note these estimates on the blackboard and discuss the range – why are some lower and some higher? Expand the discussion of garbage and waste:

- What kinds of garbage do students produce? (packaging, food waste, paper, worn out products, etc.)
- How could some of these materials be taken out of the garbage stream? (reduction, reuse, recycling, composting)
- What other materials are used and what other waste is produced that doesn't end up as garbage? (all of the energy and materials for production and transportation used in making our stuff: water, gasoline, fertilizer, pesticides, by-products, etc.)

Read the prologue of *Stuff* together. Discuss the concept of chains of production. Discuss how the use of materials and the production of waste are so much greater than we think because of these invisible chains of production. Multiply the average amount of material use (/day and /year) by the total population for the class, school, province, country, and continent. Discussion: is this sustainable?

Note: It is probably too early to answer the question of sustainability, but a good time to pose the question. Have the class discuss what they think sustainability means. Come up with a class definition that the class can return to later (consider posting it on a "Stuff" bulletin board for reference and revision).

## **A-3 Stuff Presentation**

Intent: To give students a better understanding of where all the waste discussed in the last lesson comes from and to introduce the method of product analysis. To begin discussion of the global connections and implications of consumption.

Time: 3-4 periods.

Resources: *Stuff*, bulletin board, large format world map, colored wool or string, pushpins.

Approach: In groups of three or four, students sign up for one of the chapters in *Stuff*. Each group reads and gives a five minute presentation on their chapter. For each chapter/product, students should discuss all aspects of the product's life cycle, from cradle to grave. Encourage students to make presentations active and interesting by using skits, props, multimedia, etc. As part of the presentation, students map chains of production on world map. Have a large format world map mounted on a bulletin board. Using colored wool and pushpins, students trace their product from the origin of its raw materials through to its place of manufacture and sale. Allow time for discussion and questions after each presentation.

Note: Consider the "Warning to Readers" in *Stuff* on page 6 and try to be sensitive to the mood of the class. Encourage students to discuss the ways in which the impacts discussed in the book can be reduced. Consider starting or ending these classes on positive notes – a good news environmental story, a good product, or a low impact alternative to consumption.

#### **A-4            Begin Consumption Log**

Intent: In the last lesson students worked through the products in *Stuff* and will have developed a sense of the hidden impacts and wastes created by material consumption. This lesson extends into a more active consideration of our consumption and waste production patterns. This lesson provides a framework for students to undertake a hands-on analysis of their own consumption patterns and to further encourage reflection on the social and environmental impacts of individual choices and lifestyles.

Time: 2 periods initially (ongoing).

Resources: Small booklets or enough paper for students to make their own.

Approach: Start with a general discussion about the stuff people use in a day. Have students talk about their consumption in an average day, from the time they get up in the morning until they go to bed at night. Discuss how to categorize these things (water, food, paper, entertainment, transportation, energy, etc.). Does watching TV consume materials? Reading a book? Remind students of the hidden forms of consumption that don't necessarily involve throwing something in the garbage – the materials that went into making the TV and the energy required to operate it.

Explain to students that in order to better understand their own consumption habits they are going to keep a consumption journal for one week. Referring back to the discussion of types of consumption and hidden consumption, allow them to suggest ways of keeping a journal. Help the class develop a consistent system so they can compare and summarize their results at the end of the week.

- How can they categorize the materials they use?
- How can they account for hidden aspects of consumption?
- What kind of system can they use to measure different aspects of consumption?
- How can they estimate the energy used to transport the stuff they consume?

When the class has developed a system for their consumption journals, have them put together booklets they can carry and in which they can record their observations. Include a summary page where students can add up and summarize their records. Students spend one week recording the stuff they use and contribute to using. Note: you might also keep track of your consumption for a week and share your data as an adult consumer.

Extension: See Extension E-2. Now would be a good time to initiate a broader journaling exercise.

### **A-5 Using Less**

Intent: To build on and expand students' understanding of the role and impact of recycling and waste reduction in the context of material and energy use.

Time: 2 periods.

Resources: Internet, library.

Approach: Start with a discussion of ways to reduce energy and materials consumption. Students will likely come up with the "4-Rs:" don't use things (refuse), use less (reduce), use something more than once (reuse), and reuse the materials to make a new product (recycle). Divide the class into five groups for paper, steel, aluminum, glass and plastic. Each group should research their material and present on the following issues:

- How can our society use less of the material?
- In what ways can the material be reused?
- What is the process used to recycle the material?
- Does recycling the material save energy and/or resources? If so, how and how much?
- How much of the material gets recycled and how much gets thrown out? Consider talking to local people in the recycling industry or find statistics on the national average.

Extension: Have students research the school's recycling program:

- What kinds of materials are collected? How much?
- Where do the materials go and what are they made into?
- How could the program be improved or expanded?

- If the school doesn't have a recycling program, is it feasible to set one up?

Consider the same activity with your city or region's recycling program.

Note: This activity along with C-1 will require the cooperation and participation of your custodial staff. Try to meet with them early in the unit to discuss their availability and openness to acting as a class resource.

## **A-6 For Better or Worse?**

Intent: To help students begin to think of broader applications of product analysis by developing measurable criteria. Students will be able to apply their analysis to stuff that is not discussed in the book.

Time: 1 period.

Resources: Three boxes, a paper cup, a styrofoam cup, and a reusable cup.

Approach: Game: In each box is either a styrofoam cup, a paper cup, or a reusable cup – students ask questions to determine which product has a greater environmental impact by asking questions about the production, use, and disposal of the three items. You may draw a matrix on the board to encourage students to think in terms of the complete life cycle of the three items:

	Product A	Product B	Product C
Production			
Use			
Disposal			

The focus in this exercise is coming up with the right questions – you don't need to answer these questions, although students might follow-up by researching the cup issue. Encourage the students to be specific with their questions: instead of "How is the product made?" draw out more detailed questions such as "How much energy is used in the cup's production? How much waste is produced? Are toxic wastes produced? Where is the product made?" etc.

Based on the questions, help students to produce criteria for evaluating the environmental impact of products. In addition to the cup comparison, what other criteria might be useful for other products? (e.g. local or distant production, natural or synthetic compounds, used or new, reusable or disposable, smaller/lighter or bigger/heavier, homemade or industrially made, human powered or chemically powered).

Note: criteria may not always be clear-cut. For example, homemade paper may have the advantages of being locally produced, but will not have the economies of scale gained

by industrial production (per sheet, will likely require much more water, energy, and materials). How can we balance different criteria?

### **A-7 Introduce Footprint**

Intent: To provide another, complementary, analytical tool for students to think about the cumulative impact of individual and societal choices on the planet.

Time: 2 periods.

Resources: *Stuff*, local/regional maps, colored pencils.

Approach: As a class or individually, read the conclusion of *Stuff*. Discuss the notion of ecological footprint and explain that it is a way to conceptualize our consumption. For example: growing food uses a certain amount of land per person, using wood and paper requires forest land, burning fossil fuels requires an area of plant growth (terrestrial or aquatic) to absorb carbon dioxide, etc.

Using average per capita rates (12 acres), calculate the size of the class's footprint. Draw this footprint on a local map. Do the same with school's footprint and town or city's footprint. Discuss:

- How is the size of the class's footprint related to the consumption of stuff?
- What would be some ways to reduce the size of the class's footprint?
- What would happen if everyone in the world had an ecological footprint the size of North Americans'?

Extension: Take class outside and trace out the size of an average individual footprint – have students figure out the dimensions (12 acres = 4.86 ha = 220m x 220m). Ideally, find a field large enough to trace the entire periphery of the footprint, marking the corners with flags or cones. If space does not permit, measure off 220 m in one line and have students imagine the size of the square. Discuss students' responses to the average size of our ecological footprint.

Note: For further details on ecological footprints see: Wackernagel, Mathis and William Rees. 1996. *Our Ecological Footprint*. Gabriola Island BC: New Society Publishers.

### **Module B: Your Stuff**

This module focuses on your students' own consumption patterns and resulting environmental impacts. Expanding upon the concepts and analytical tools developed in the first module, the focus is on individual awareness and responsibility within a larger, global web of production and consumption. The intent of this module is not to make students feel guilty about their lifestyle, but to give them the framework within which to understand their relationship to stuff. Depending on the socio-economic demographics of your class, sensitivity will be required when discussing students' material wealth and

lifestyle. For example, if you expect large disparities in the class, frame discussions so that students aren't pressured to reveal specifics about their economic status.

### **B-1 Report and Compare Consumption Logs**

Intent: To give students a scientific, analytical tool to record and reflect on their own consumption patterns. To begin a more detailed examination of students' own consumption patterns.

Time: 1 period.

Resources: Completed consumption logs.

Approach: Students summarize material and energy consumption on summary page of consumption log. Survey the class and find the average amount of consumption and waste for each of the categories recorded. Discuss the following:

- Were students surprised by the amount of stuff they use?
- In what categories and through what means might they reduce their consumption?
- Does the amount of energy and/or materials used relate to the amount of enjoyment or satisfaction that they got from activities and products? Why or why not?

### **B-2 Tracing Your Stuff**

Intent: To give students a sense of the chains of production and disposal of which they are a part. While most of the focus in the unit is on consumer goods and their impact on the environment, this lesson encourages students to think about some of the other energy and materials that they use in their everyday life.

Time: 2 periods.

Resources: Library, Internet, municipal resource people.

Approach: In groups, students research and report on one aspect of their daily consumption: water, food, or energy (electricity and/or natural gas). Using a regional map (add to bulletin board), trace the web of connections:

- Where does this stuff come from?
- Where does it go?
- What are the impacts of its consumption?
- What would be some ways to lessen these impacts or reduce consumption?

If possible, arrange for a resource person to come in and talk about one or more of the topics for this lesson or arrange a site tour of an appropriate facility.

### **B-3 Your Own Product Analysis**

Intent: Students research and apply the methods of product analysis to a product of their choice. Clearly, producing an analysis of the scope and detail provided in *Stuff* takes time and resources beyond the capacity of your class. More important than the accuracy of the final product is the process of students thinking about the components of their product's life cycle: its production, consumption, and disposal.

Time: 3-4 periods.

Resources: Library, Internet, *Stuff*.

Approach: Students choose a product not in *Stuff* (pencil, pen, notebook, binder, skateboard, knapsack, baseball cap, basketball, peanut butter and jam sandwich, pizza, Kraft dinner, compact disc, chewing gum, lip gloss, etc.). Students research and tell the story of their product, from cradle to grave.

While the focus is on research, encourage students to invent a plausible story if they are unable to find specifics on some aspects of the product they have chosen. Fictionalized parts of the story should be placed in brackets or underlined to distinguish from more factual information. The report should include drawings, photos, maps and any other material that will help tell the story. You may choose to assign this project in a report format, or in a larger, display format.

Link: Ask students to notice media and advertising and to think about how media affect people's consumption patterns.

### **B-4 Media and Advertising**

Intent: To encourage students to reflect upon the influence of media and advertising on their consumption patterns.

Time: 2 periods.

Resources: Old magazines, newspapers, flyers, etc., bristol board, glue, scissors.

Approach: In small groups of 4 or 5, students create a collage of advertisements that encourage consumption. Each group then discusses and makes notes on all or some of the following questions:

- Does advertising affect our consumption patterns?
- How does advertising affect consumption patterns?
- Did anyone find ads encouraging recycling or waste reduction? Why or why not?
- Does advertising specifically target people in their age group? How and why?
- How might TV shows and movies from North America affect global consumption?

Each group will then show its collage to the class and discuss responses to the questions.

Extension: Have students monitor television programming and advertising for a week and report back on the following:

- How much time is devoted to advertising and how much to programming?
- What kinds of products are advertised during different kinds of programs?
- How often (in programs or advertisements) are “new,” “more,” “bigger,” and “better” emphasized? Why?
- What kinds of stories do commercials tell?
- What kinds of consumption patterns are modeled by characters in television programs?

## **B-5 Space Mission**

Intent: To encourage students to think about the difference between needs and wants in terms of consumption. To think about the Earth as a self-contained system.

Time: 1-2 periods.

Resources: Space mission handout, pen or pencil.

Approach: Students complete space mission handout listing the stuff they would take with them on a five-year voyage. Discuss the following:

- What waste products will be produced by your stuff?
- How will you deal with this waste?
- How did you choose what to bring and what things do you really value?
- In what ways is the planet Earth like a spaceship?

Put students into groups of four and have them come up with a common list with a total of 20 kg. As a class, discuss the lists and the process used to arrive at them.

## **Module C: Your School’s and Community’s Stuff**

This module expands the focus from individual consumption to a broader look at the school’s and the local community’s consumption patterns and environmental impact. Students are encouraged to reflect on the choices and impacts we make as a society.

### **C-1 School Throughput**

Intent: Students begin to consider the issue of consumption and material use in terms of systems. The school, as a model of an energy/material system, can then be compared to larger systems.

Time: 2 periods.

Resources: Map of school, access to custodian and office staff.

Approach: Start as a class by discussing the materials and energy used at the school. It may help to think in terms of the various components of the school: the school grounds, the cafeteria, the office, the various classrooms, etc. In small groups, students investigate the energy and material throughput of the school (electricity, natural gas, water, paper, food, other). What comes in, how much, how is it used and transformed, and where does it go? Students make a diagram (map of school) to show the pattern of use. Groups present throughput maps and add to bulletin board to display results.

Brainstorm ideas about how to reduce the amount or impact of materials and energy used by the school. Implement ideas. Set up a monitoring program to track how changes affect throughput for the remainder of the school year. How can the class set up a system to continue monitoring in future years?

Note: It may be difficult for the class to initiate any meaningful change in the time they have available. Rather than discouraging the students, encourage them to think about the obstacles to change: how are decisions made about stuff used in the school?

## **C-2 Decision-Making Activity**

Intent: Students will now be more aware of the stuff we use and the choices we make. Given that we do make choices, both individually and as a society, students question and begin to understand the kind and amount of information used in decisions about what stuff gets used. Student research will reveal how significant environmental impact is as a factor in decision-making.

Time: 2 periods + time outside of class.

Resources: Notebook, pen or pencil, access to office staff, municipal or regional staff, business people.

Approach: Begin by brainstorming what factors students consider when making decisions about buying something, for example, a pair of shoes. Expand list to include all factors that might affect someone's decision to buy (e.g. cost, reliability, reputation, country of origin, social impact, environmental impact, fashion, advertising, status, quality, durability). Have students design a survey to determine the importance of these various factors in actual buying decisions.

Students then interview one decision-maker regarding buying decisions for one product (in school: paper supply, staff room coffee; at home: vehicle, clothes, household appliance; in community: new buses, new roads, new community building; in business: new equipment). In class, students compare results and list factors from most to least important. Discuss the following:

- Are different factors important for different products or decisionmakers? Why or why not?
- Are priorities different than those of students in the class?
- Should environmental and social impact be more or less important? How might this change occur?

### **C-3            Made in...**

Intent:            To encourage students to think more critically about the products they use every day and about the chains of production which link them with other places both near and far.

Time: 1 period.

Resources:    Colored stickers, markers.

Approach:        Remind students about the introduction to *Stuff* where the narrator, Dana, talks about putting a “Made in...” sticker on all the junk in the basement. Proceed to put color-coded stickers on as much stuff in the class as possible (students may add some of their personal items to the process). Color code stickers for United States, Canada, Latin America, Europe, and Asia, and other. List items by origin on the blackboard or bulletin board. Discuss the methods and implications of transporting all those materials to the classroom. String and label another web on the world map bulletin board showing the connections. Discuss the following:

- Why is so much of our stuff from “away”?
- Could more of the classroom items be produced locally?

Extension:        Research working conditions and environmental regulations in some other countries. How do they compare to the U.S. or Canada?

### **C-4            Alien Eyes**

Intent:            For students to observe our society in terms of its consumption patterns and to draw inferences about the things we value.

Time: 1-2 periods.

Resources:        Alien Eyes worksheet

Approach:        Hand out the Alien Eyes worksheet with your students and review it with them to make sure they understand the concepts and the assignment. When the assignments are complete, have students discuss their observations in small groups or as a class. Did students think about our stuff and our values in a different way?

## Alien Eyes Worksheet

You are a student from an alien culture sent to study human beings and their values. Unfortunately, you don't understand the language and can't communicate with anyone directly. You must draw conclusions about the culture and values of these Earth-beings from the stuff which humans collect.

- What things do humans put energy into producing and buying?
- What can you tell about the things that are important to humans?

You don't understand the concept of money, but can see that humans trade their time so they can get little pieces of paper and metal to trade for things.

- How much of their time do humans trade to buy a CD, a new pair of jeans, or a new car?
- Does trading their time for pieces of paper seem to make humans happy?
- What other things could they do with their time which wouldn't require money?

Your assignment:

Write a short report (1-2 pages) for your home planet describing your observations and conclusions about humans and their stuff.

Name

Space Mission

Crew  
Member

	Item	Weight	Reason
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Be prepared to report back to the rest of your space mission crew and to support your choices.

## **Module D: More Stuff, Less Stuff**

This module concludes the unit by putting our consumption patterns in historical and cultural context. By doing so, this final module opens students to the relativity of consumption patterns and to the possibility of changing these patterns.

### **D-1 Oral History**

Intent: To help students understand the historical context of our current consumption patterns.

Time: 2 periods (+ time outside of class).

Resources: Notepad, pencil or pen, tape recorder, if available.

Approach: As a class, students make up a questionnaire of five or ten questions designed to elicit responses about material and energy use of previous generations. Questions should be based on areas of consumption discussed in the other modules, including energy, materials, water, transportation, entertainment, etc. Using the questionnaire, students interview two people – one from their parents’ generation and one from their grandparents’ generation. Record responses with a tape recorder or written notes.

Students write a summary report on how consumption patterns have changed over the past two generations. Discuss the following:

- Why this change has occurred?
- How has this change affected our society’s impact on the environment and the size of our footprint?
- What might consumption patterns have been like 200 years ago?
- How does the amount of stuff people use affect their lives and the quality of their lives?
- Will students’ grandchildren be able to have the same kind of lifestyle that young people have now? Why or why not?

Extension: Research the consumption patterns of First Nations people in the U.S. or Canada before European contact. In what ways were these patterns more or less sustainable? More or less satisfying or healthy?

### **D-2 Other People’s Stuff**

Intent: To introduce and prompt discussion about the cultural and social influence on our consumption patterns.

Time: 2 periods (+ research time).

Resources: Library and Internet.

Approach: Students choose one country outside of North America and research the lifestyle and consumption patterns of the people living there. Based on their understanding of the North American footprint, students estimate the footprint of people in their research country. Students should consider the relative size of a footprint by considering the various elements of the society's lifestyle: food, housing, transportation, and consumer goods. Students write a short report explaining and justifying their conclusions. (See *Material World* in Related Resources section for information and discussion.)

Extension: Using a graphic footprint, students indicate average per capita footprint on world map bulletin board.

Link: Ask students to think about the ways in which societies and cultures change their consumption patterns over time. What tools can be used to bring about change?

### **D-3 Ways to Change**

Intent: To give students a sense of the possibilities for changing our current consumption patterns and to introduce various avenues for change.

Time: 2 periods.

Resources: Library, Internet.

Approach: Students form a commission on reducing our environmental impact by changing our consumption patterns. Have the class brainstorm different ways that change can be promoted (e.g. education, economics, lifestyle, laws, technology, infrastructure, etc.). Divide the class into groups to research and come up with recommendations for each method of change. Each group should consider different social levels in which change can take place: individual, family, group, city or town, province, and country. Once students have formed groups and done their research the class will convene a roundtable discussion to present ideas and discuss the pros and cons of each method of social change. Students agree on and write an action plan.

Extension: Based on the action plan, students write and send a letter to appropriate officials (school, local government, provincial government, federal government, UN). The exercise may also lead to implementation of a plan within the school.

## **D-4 Sustainable Wonders**

Intent: To wrap up the unit by focusing on positive tools for lowering our consumption and reducing our footprint.

Time: 2 periods.

Resources: Internet, library.

Approach: Students research one tool or technology that is especially efficient, conserving materials and energy (e.g. ceiling fan, reusable lunch bag, fluorescent light, vegetable garden, low-flow shower head, push mower, bicycle, or clothesline). Students write a brief report on their tool discussing how it works, why it is a sustainable wonder, and how we might get more people to use it.

Extension: Students design and describe their own sustainable wonder. (See *Seven Wonders* book in Related Resources).

### **More Extension Activities**

#### **Extension 1 - Design and Build Project**

Intent: Applying their understanding of product analysis, students design and build a product with the lowest impact possible. This lesson gives students the opportunity for a creative, hands-on application of their learning.

Time: 3-4 periods.

Resources: Will vary.

Approach: Students choose a product to design (CD rack, birdfeeder, chair, etc.). Keeping in mind the impact of various materials, students create a design that they can build. Along with building the final product, students write a report on all the materials they used, the impact of the product, and recommendations for the end of the product's life cycle.

#### **Extension 2 - Consumption Journal**

Intent: To encourage further personal reflection by students about stuff in the context of their own lives.

Time: Ongoing.

Resources: Notebook.

Approach: Along with the consumption log, students undertake a “stuff” journal at the beginning of the unit. In daily entries, students reflect on the following:

- the amount of stuff they consumed
- the amount of waste they produced
- low impact products they notice, high impact products they notice
- the effect of advertising on their consumption
- how they spend their own money
- things they value that do not involve high consumption.

### **Extension 3 - Focus on Wood**

Intent: For students to have the opportunity to have a more in-depth look at an important resource and its transformation into consumer products.

Time: 2 periods + research time.

Resources: Library, Internet, forest industry and environmental resource people.

Approach: Students choose a specific wood product (paper, furniture, lumber, chopsticks, etc.) and research the origin of the wood used.

- Does wood originate?
- Where does the manufacturing take place?
- How far does the wood eventually travel?
- What chemicals and energy were used to make the product?
- Students may also contact a forest company and find out where they ship their wood and what products are manufactured from it?.
- How much of the tree gets used as lumber?
- What happens to the rest of it?

### **Extension 4 - Field Trips**

There are many opportunities to get out of the classroom to observe and explore the themes developed throughout this unit. Suggestions: landfill site, recycling center, power facility, water treatment plant, mall, or forest (to observe the natural recycling of energy and materials).

### **Glossary of Stuff Terms**

By-products – something produced in addition to the main product. For example, wood chips are a by-product of making lumber from trees. Sometimes by-products may be

used for other products (to make pulp and paper, in this example) or sometimes by-products become waste.

Chains of production – the invisible links that go into the manufacture of a product: the extraction and collection of raw materials, transportation of raw materials, processing of raw materials, transportation of components, manufacture of product, transportation of product, and sale of product. All of these links occur before you actually use and dispose of a product. Each of these links also produce by-products and waste. In the end, the amount of garbage produced when you throw something out is small compared to all of the waste that is produced in the manufacturing and transportation of the product. The stuff we use and dispose of is like the tip of an iceberg – most of the waste and materials consumption is hidden.

Consumer societies – While all societies consume to some extent, there is a big difference between the amount of consumption. People in India, for example, use only about 1/10 of the energy and resources per capita that we do in North America. Consumer societies refer to the industrialized, high-consumption societies of North America, Australia, Europe and parts of Asia (and, increasingly, the rest of the world).

Consumerism – An orientation to life that defines humans by their role as consumers.

Ecological Footprint – A way to think about the resources required to support a certain lifestyle: it measures what area of the Earth is required to keep a population or an individual alive at a certain level of material consumption. It represents the “natural capital” necessary to provide renewable resources, such as food, water, and oxygen as well as the natural resources necessary to eliminate our wastes, such as plants to absorb carbon dioxide.

Product analysis – A way of looking at consumer items to help understand the full range of impacts from their production, transportation, consumption, and disposal.

Post-consumer waste – Waste that is produced from the use of a product as opposed to waste created during production.

Sustainable – Any process that can be continued indefinitely. In terms of consumption, sustainability suggests that the production use and disposal of the product will not deplete the productive capacity of the planet.

Throughput – In looking at a closed system (a car, an organism, or a school), throughput refers to the energy and materials that go into and the waste that comes out of that system.

## **Related Resources**

NEW BC or Northwest Environment Watch do not take any responsibility for these resources; they are provided to assist research and further development of concepts discussed within this curriculum. To the best of our knowledge at the time of publication, reference materials and websites were accurate and appropriate.

## Books

Brower, Michael and Wade Leon. 1999. *The Consumer's Guide to Effective Environmental Choices: Practical advice from the Union of Concerned Scientists*. Three Rivers Press.

Looks at the full range of consumer activities, identifying those that cause the most environmental damage and those that cause the least.

Durning, Alan Thein. 1996. *The Car and the City*. Northwest Environment Watch report no.3, Seattle.

Excellent up-to-date and easy-to-read book full of good statistics on car use, pollution, city problems and alternatives.

Goodwin, Neva, Frank Ackerman and David Kiron eds. 1997. *The Consumer Society*. Island Press, Washington, D.C.

This is a fine collection of scholarly essays on all aspects of consumerism. Probably the best, most comprehensive introduction to the issue available. Includes a mix of current and historical material.

Johnston, Lorraine. 1990. *Green Future: How to make a world of difference*. Penguin Books Canada, Markham, Ontario.

Good textbook on resources, pollution and alternative fuel uses.

Menzel, Peter. 1994. *Material World: A Global Family Portrait*. Sierra Club Books, San Francisco.

This book would make an excellent classroom resource. Sixteen of the world's best photographers collaborated to produce this visual masterpiece which documents the lives of statistically average families in 30 nations – by looking at their stuff.

Mitchell, Lucy Sprague. 1991. *Young Geographers*. Bank Street College of Education, New York.

A classic book for elementary teachers.

Ryan, John C. 1999. *Seven Wonders: Everyday Things for a Healthier Planet.*, Random House, New York.

Companion book to *Stuff* celebrating seven time-honored tools that can help us to live more lightly on the earth and serve as a springboard for examining critical environmental issues.

Wackernagel, Mathis and William Rees. 1996. *Our Ecological Footprint: Reducing human impact on the Earth*. Gabriola Island BC, New Society Publishers.

Excellent resource for teaching about sustainability. Details the human impacts on the planet in terms of ecological footprint analysis.

## Web sites

### Consumerism

- <http://www.newdream.org/discuss/living.html> – At this site the Center for a New American Dream provides activities and assignments designed to provoke discussion and critical thinking on consumerism. The site also contains lesson plans excerpted from “Living in a Material World: Lessons on Commercialism, Consumption, and Environment.”
- <http://www.ucsusa.org/guides/greentips> – At this site, the Union of Concerned Scientists provide great tips on ways to reduce the impacts of consumerism. Also includes a link to the Great Green Web Game, a fun game based on discovering which purchases do the greatest good for the environment.
- <http://www.pbs.org/kcts/affluenza/map/map.html> – This site was inspired by the PBS special *Affluenza*, a documentary on the consumption culture of America. Contained within the site is a history of how our present consumption patterns evolved and a useful Teacher’s Guide, which provides lesson ideas on both consumption and advertisements for grades 5-12.
- <http://www.davidsuzuki.org> – The David Suzuki Foundation site provides useful suggestions on ways to lighten your ecological footprint. It is also a useful site for researching BC’s most prominent environmental issues.
- <http://www.iclei.org/iclei/ecofoot.htm> – This site provides information about a report titled “Ecological Footprint of Nations” and compares the ecological impact of 52 large nations inhabited by 80% of the world population.
- <http://www.rprogress.org/programs/sustainability/ef/> – Redefining Progress is a public policy organization generating and refining innovative policies and ideas that promote sustainability. This page outlines EF concept and links with a “calculator” that illustrates distribution of EF’s and income worldwide. Lists many other links and resources regarding EF.

- <http://radio.cbc.ca/programs/ideas/shows/stuff/index.html> – This site has an extensive list of references suggested by the CBC Ideas: Drowning in Stuff program on consumerism.
- <http://www.simpleliving.net> – The Simple Living Network is an on-line service containing thousands of pages of information about publications and tools to live a more conscious, simple, healthy and restorative lifestyle.

### **General Environmental Education**

- <http://www.schoolsgogreen.org>- This site by The Center for Environmental Education in New Hampshire is also connected to the Antioch New England Graduate School. They offer quarterly newsletters and environmental grants to schools.
- <http://eelink.net/ee-linkintroduction.html> – The Environmental Education Link site is useful for classroom resources on consumption as well as for environmental education in general.
- <http://www.edu.uleth.ca/ictrd/cjee/> – This site by the Canadian Journal of Environmental Education provides links to many Canadian environmental education websites.
- <http://www.earthsystems.org/index.html> – This site offers over 1,000 links to environmental resources via a virtual library.
- <http://www.worldwatch.org/> – This site by World Watch is a great place to begin researching environmental issues.
- <http://www.eeexchange.org> – The Environmental Education Exchange site is a great place to find how other teachers have successfully implemented environmental education. Also provides links to other useful sites as well as lesson plans and projects for environmental issues.
- <http://www.wri.org/enved/edulinks.html> – The World Resources Institute site contains easy-to-use teaching units based on the most recent and authoritative information on the global environment.

### **Media and Advertising**

- <http://create.familyeducation.com/topic/front/0,1156,2-2455,00.html> - The Family Education Network site offers loads of information on media literacy as well as ideas for teaching all ages of children to think critically about media and advertising.

- <http://www.adbusters.org/main/index.html> – Available at this website are advertising spoofs that are a great way to encourage students to think more critically about messages they receive from advertising.

### **Curriculum Packages**

- Popnet: This package was designed by the Education Development Center Inc. in Newton, Massachusetts. The goal of Popnet is to help high school students understand the relationship between population growth, poverty, excessive resource consumption, and environmental decay. The program includes teaching /learning materials, Internet forums, and teacher training. For further information contact Karen Hlynshy at (401) 941-8249 or [Khlynsky@edc.org](mailto:Khlynsky@edc.org).
- The Technology Trap Series: The Sierra Club of BC and the GAIA Project worked together to create this package. This series includes three modules: Transportation: Who's in the Driver's Seat; Follow the Paper Trail: Technology, Wood Consumption and Alternatives; and Trees, Toilets, and Transformations: Inspirations from El Salvador. The goal of the series is to give students the opportunity to investigate technology and the role it plays in their lives. For more information contact the Gaia Project at 1103 Oscar St. Victoria, BC V8V 2X3; Tel: 1 (250) 386-5225 or 1 (250) 384-1534; email [gaia@islandnet.com](mailto:gaia@islandnet.com) or [sbcedu@islandnet.com](mailto:sbcedu@islandnet.com)
- Destination Conservation: Destination Conservation is an activity-based school program where students, staff, school district staff and utility companies interact to initiate environmental education and conservation activities. It has been commended not only for combining hands-on learning with resource conservation, but also for saving school districts money. For more information about Destination Conservation programs in British Columbia contact the Sage Foundation at 744 West Hastings St., Suite 410, Vancouver, BC, 1 (604) 669-6222. They also have a helpful website: <http://www.edu.uleth.ca/ciccte/sage/destcon/htm>

### **Audio-Visual**

- Affluenza. 1998. PBS. Affluenza looks at practical solutions to the problem of “affluenza” – an epidemic of stress, waste, overconsumption and environmental decay. To order your own VHS copy of Affluenza contact Bullfrog Films toll-free at 1-800-543-FROG, by e-mail at [bullfrog@igc.org](mailto:bullfrog@igc.org), or on the Web at [www.bullfrogfilms.com](http://www.bullfrogfilms.com)
- Escape from Affluenza. 1999. PBS. This follow-up to Affluenza shows how some Americans are calling a halt to keeping up with the Joneses and abandoning the consumer chase. To order your own VHS copy of Escape from Affluenza contact Bullfrog Films toll-free at 1-800-543-FROG, by e-mail at [bullfrog@igc.org](mailto:bullfrog@igc.org), or on

the Web at [www.bullfrogfilms.com](http://www.bullfrogfilms.com)

- All the Right Stuff. 1997. National Film Board of Canada. This 25-minute production is about kids, malls, media and money. The position of youth in our consumer economy is explored in this hip-hop style documentary. It is an excellent resource to teach young consumers about advertising, consumerism and marketing. To order your own VHS copy of All the Right Stuff contact Bullfrog Films toll-free at 1-800-543-FROG, by e-mail at [bullfrog@igc.org](mailto:bullfrog@igc.org), or on the Web at [www.bullfrogfilms.com](http://www.bullfrogfilms.com)
- Adbusters Uncommercials. Various dates. Adbusters. Uncommercials provide creative and thought-provoking criticism of advertising and consumerism. They are a great way to encourage students to think more critically about messages they receive from advertising. To order contact Adbusters at 1243 West 7th Avenue, Vancouver, B.C V6H 1B7, Tel: 1 (604) 736-9401, e-mail: [info@adbusters.org](mailto:info@adbusters.org) or at <http://www.adbusters.org/main/index.html>
- Deconstructing advertising: Making sense of commercial culture. 1993. Spectra Communications. It examines the all-pervasive influence of advertising in our society, documenting how it both mirrors and shapes our cultural values and perceptions of reality. Topics include materialism/consumerism, social/ethical/psychological ramifications, happiness, and poverty. It can be obtained from the SFU library.
- Reading TV. 1996. National Film Board of Canada. This production is an introductory resource for media literacy, and specifically deals with television as a source of information and frame of reference for interpreting experience and the world. It is a compilation of previously released short films and animation on the subject of television. A helpful insert for teachers provides questions and topics for discussion, related activities and exercises, information resources, contents listing, and synopsis. For more information or to order you may contact the National Film Board of Canada at 1 (800) 267-7710, or check at your local library for a copy.
- Pleasure Planet. 1992. BC Ministry of Education. This show links environmental problems with overconsumption and overpopulation. For more information contact the BC Ministry of Education.
- Technology's Price. 1992. BC Ministry of Education. This show deals with pollution and technology issues including the car, telephone, electricity, and alternative technologies, and relates them to the concept of sustainability. For more information contact the BC Ministry of Education.

## Plays

- “Barbie Get Real” is a play by Jennifer Gailus and Olivia Martin, a pair of students from Seattle Pacific University. This play takes aim at materialism through a cast of Barbies and is based on the girls’ experiences in high school. It is published in “Beautiful Girls and Other Winning Plays from the 1996 Baker’s Plays High School Playwriting Contest.” For more information, contact Baker’s Plays, 100 Chauncy Street, Boston, MA 02111-1783. Phone: (617) 482-1280; fax: (617) 482-7613. Part of the play can be accessed at <http://www.pbs.org/kcts/affluenza/show/barbie.html>

## Songs

- For a useful shift in presentation modes, try the song “Are My Hands Clean?” by Sweet Honey in the Rock, on their Live at Carnegie Hall album. It brings a social justice perspective to the critique of consumerism in a powerful semi-rap musical form. The basic outline of the song is the history of a cotton-polyester blouse, from oil fields to Sears.

## Software

- EarthAware is a software program designed to teach environmental awareness. It consists of questionnaires on six topics: Energy and Water, Transportation, Consumerism, Waste, Advocacy and Livelihood, Land Use, & Family Planning. The aim of this program is to link the user to the environment through quantifying their resource use. More information is available on this product at: <http://www.paradisecinema.com/pc7/donlotter/homepage.html/>. EnviroAccount Software, 605 Sunset Ct., Davis, Ca 95616. Contact Don Lotter at [dwloller@dcn.davis.ca.us](mailto:dwloller@dcn.davis.ca.us) for further information.

## Tapes

- Ideas: Drowning in Stuff. 1999. CBC Radio One. This four part series looks at western consumer culture, its roots, and the effects on the environment and society at large. To order a printed transcript of all 4 parts of the series, send a check or money order for CDN\$22.00 (includes all taxes and shipping) to Ideas Transcripts, Box 500, Station A, Toronto, Ontario, Canada M5W 1E6. For a set of audiocassettes, send a check or money order for CDN \$34.00 to the same address.

## British Columbia Curriculum Links

### Unit Maps

- This package has been developed to address the full range of issues and curriculum links relevant to *Stuff*. Ideally, teachers would have the time and support to work through the lessons sequentially, allowing time to fully explore issues and projects. However, given the large demands on classroom time, we recognize this in-depth study will not always be possible. Here we provide a

chart overview of the full unit (not including extension activities). We encourage teachers to find routes through the material that meet the unique objectives of their class. Generally speaking, later lessons build on previous ones and the general progression of lessons should be maintained. We also provide a “fast track” approach that provides a pre-selected progression through the key lessons of the unit.

### Assessment

- There are many tangible projects that students will produce throughout this unit. These reports, worksheets, and presentations offer opportunities for ongoing student assessment. However, there are often no “right answers” to many of the questions raised. In addition to the standards normally applied to individual and group work, we suggest the following evaluative criteria:
- Understanding of key concepts – the lessons do not focus on facts and statistics, but rather on tools and concepts. How well do students grasp these tools and concepts? How well are they able to apply them?
- Reflection – looking at the stories of consumer products is a tool for reflection, not an end in itself. How do students relate concepts to their own lives and consumer choices?
- Creativity – while there are no right answers to many of the questions raised by examining our stuff, there are lots of possible directions. How creative are students in posing questions and suggesting alternatives to the status quo?

### Portfolio

Several of the lessons suggest the display of research and project materials on a bulletin board designated for *Stuff* – creating a stronger sense of group process and inquiry. In addition, student portfolios may assist in evaluating individual progress and understanding, while providing a focus for student work.

The following chart outlines the curriculum links to the BC Ministry of Education Integrated Resource Packages (1998). While there are additional links to art, language skills, math, and other areas, this chart shows the primary links to five curriculum areas: Grade 8 Social Studies and Science, Grade 9 Social Studies and Science, and Grade 12 Geography.

Grade 8	Module		
Applications of Social Studies <u>Module D</u>	<u>Module A</u>	<u>Module B</u>	<u>Module C</u>

identify and clarify a problem,

an issue, or an inquiry	1,2,3,4,5,6,7	2,3,5	1,2,3,4	1,2,3,4
gather and organize a body of information from primary and secondary print and non-print sources, including electronic sources	3,4,5	1,2,3,4	1,2	1,2,3,4
interpret and evaluate a variety of primary and secondary sources	2,3,5	1,2,3	1,2,4	1,2,3,4
assess a variety of positions on controversial issues	3	5	2	1,2,3
plan, revise, and deliver written and oral presentations	3,5	2,3,4,5	1,2,4	1,2,3,4
co-operatively plan and implement a course of action that addresses the problem, issue, or inquiry initially identified	5	2	1	3

Grade 9:

Applications of Social Studies  
Module D                      Module A                      Module B                      Module C

identify and clarify a problem, an issue, or an inquiry	3,4,5,6,7	1,2,3,5	1,2,3,4	1,2,3,4
select and summarize information from primary and secondary print and non-print sources, including electronic sources	3,4,5	1,2,3,4	1,2	1,2,3,4

Applications of Social Studies  
Module D                      Module A                      Module B                      Module C

defend a position on a controversial issue after considering a variety of perspectives	5	2	3	
plan, revise, and deliver formal oral and written presentations	3,5	2,3,4,5	1,2,4	1,2,3,4
co-operatively plan, implement, and assess a course of action that				

addresses the problem, issue, or inquiry initially identified	5	2,5	1	3,4
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Grade 8:

Applications of Science	<u>Module A</u>	<u>Module B</u>	<u>Module C</u>	
<u>Module D</u>				

use graphs and simple statistics to analyze data	3,4,5,7	3	1,2,3	2
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use information and conclusions as a basis for further comparisons, investigations, or analyses	2,3,4,5,6,7	1,2,3,5	1,2,3,4	1,2,3,4
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critique information in a variety of media	4			
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analyze the costs and benefits of making alternative choices that impact on a global problem	2,3,5,6,7	1,2,3,5	1,2,3,4	1,2,4
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Grade 8:

Life Sciences (Social Issues)	<u>Module A</u>	<u>Module B</u>	<u>Module C</u>	<u>Module D</u>
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assess different impacts of using renewable and non-renewable natural resources	1,2,3,5,6,7	1,2,3,5	1	1,2,4
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compare and contrast the practical, ethical, and economic dimensions of population growth and polluted environments	7	2	1,2,3	
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relate the extraction and harvest of earth's resources to sustainability and reduction of waste	1,2,3,5,6,7	1,2,3,5	3,4	1,2,4
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Grade 8:

Life Sciences (Global Ecosystems)	<u>Module A</u>	<u>Module B</u>	<u>Module C</u>	
<u>Module D</u>				

evaluate how major natural events and human activity can affect local and global environments and climate change	3,5,7	2,3	1,3	1,2
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Grade 9:

Applications of Science  
Module D

	<u>Module A</u>	<u>Module B</u>	<u>Module C</u>	
analyze a system by identifying the interaction between the various parts	4	3	1,2,3	
describe relationships and analyze patterns of change	3,5	3	1,2,3	1,3
debate a variety of socio-scientific issues	3,5	2	2,3	

Geography 12:

The Nature of Geography

	<u>Module A</u>	<u>Module B</u>	<u>Module C</u>	<u>Module D</u>
explain how physical and human systems interact within an ecosystem	7	2,3,5	1	2,3

Geography 12:

Resources of the Earth  
Module D

	<u>Module A</u>	<u>Module B</u>	<u>Module C</u>	
explain contemporary concepts of sustainability	7	1		
explain how concepts of sustainability vary with time and place		1,2		
assess the compatibility of human activities and population growth with concepts of sustainability	3,7	3,5	1	1,2,3,4

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