

Lesson #14: Project: Take-Make-Waste → MAKE Report

Stage 1 – Desired Results	
Established Goals: GLO B: Explore problems and issues that demonstrate interdependence among science, technology, society and the environment	
GLO C: Demonstrate appropriate inquiry, problem-solving and decision-making skills and attitudes for exploring scientific and/or technological issues and problems	
Understandings: Students will understand that... 1. Science-based decision-making models such as The Natural Step's 4 sustainability guidelines can be used to help make decisions about how to TAKE-MAKE-WASTE more sustainably. 2. Science is a useful and essential tool in addressing sustainability	Essential Questions: SLO C3: How can the Natural Step's 4 sustainability guidelines be used to help in decision-making about how to TAKE-MAKE-WASTE more sustainably?
Students will know... 1. SLO B3: Identify factors that affect health and explain the relationships of personal habits, lifestyle choices, and human health (individual/social) 2. How to apply the 4 guiding ideas to their organization. 3. A great deal about the science behind their individual products.	Students will be able to... SLO C5: Work cooperatively with others and value their ideas and contributions SLO B5: Identify and demonstrate actions that promote a sustainable environment, society and economy (locally/globally)
Stage 2- Assessment Evidence	
Knowledge: 1. Assess the students ability to identify factors that affect health (using an original example)	Skills: Assess ability to work cooperatively (Groupwork Evaluation) Assess Decision-Making Process (Appendix 9 (p.54 &55))
Materials Required	
Powerpoint: Project TAKE-MAKE-WASTE (you may want to re-word the 4 system conditions according to the wording that your class understands/prefers) Handouts: (you may want to re-word the 4 system conditions according to the wording that your class understands/prefers) How To Complete the Summary Charts of the TAKE-MAKE-WASTE Reports (already given with TAKE Report but reference to it is warranted) How to Complete the MAKE Report (more specific to the MAKE report) MAKE Report Summary Chart Evaluating the Action Plan of YOUR Organization Access to websites (or paper copies of pertinent info) DVD: Captain W Productions. (n.d.). Ecology of Commerce. Schumacher College: Dartington Totnes Devon, UK: Captain W Productions (Title 2: Paul Hawken Ecology of Commerce 41:27-47:40) Access to web: CBC's The Hour featured a short interview with Ray Anderson: Ray Anderson on The Hour (added August 3, 2007) Retrieved August 4, 2007 from http://www.cbc.ca/thehour/video.php?id=1333	
Stage 3 – Learning Plan	
1. Slide 14- This report is similar to the TAKE report and so will require less explanation. This phase is more research based and students might need extra guidance as they try to research. 2. SHOW students DVD: Captain W Productions. (n.d.). Ecology of Commerce. Schumacher College: Dartington Totnes Devon, UK: Captain W Productions (Title 2: Paul Hawken Ecology of Commerce (41:27-47:40). SHOW on-line interview if available. Help them to think of ideas on how to move their product toward sustainability. 3. HANDOUTS: How To Complete the Summary Chart of the TAKE-MAKE-WASTE (refer back to this) How to Complete the MAKE Report	

MAKE Report Summary Chart

Guide students through the MAKE report encouraging them to consider both the processes used to make their product and the wastes that are by-products of the processes

3. Provide access to research resources where needed.

4. As part of the TAKE Report, students will complete the HANDOUT: “Evaluating the Action Plan of YOUR Organization” and present their action plans to the class.

Extension Learning Activities

Ecology of Commerce

(DVD: Captain W Productions (n.d.). Ecology of Commerce. Schumacher College: Dartington Totnes Devon, UK: Captain W Productions)

Title 2: Paul Hawken – The Ecology of Commerce

(41:27-47:40)

(Question & Answer period)

A participant asks about the pressure that owners/ corporations have to make money and how that is compatible with these ideas on sustainability. Hawken provides two examples of how businesses have made money by moving toward sustainability. The first is a company from Sweden (I could not understand the pronunciation).

The second is Interface (chair, founder and former CEO, Ray Anderson). The science behind what they changed was not very difficult. They simply separated the top of their carpets (made of nylon 6,6) from their backing (made of PVC). With this change, rather than having the carpet go into the landfill, it goes into the recycling bin and it can be repolymerized and used again. This allowed the company to save a great deal of money. The company did other changes too.

CBC's The Hour featured a short interview with Ray Anderson:

Ray Anderson on The Hour (added August 3, 2007)

<http://www.cbc.ca/thehour/video.php?id=1333>

“Remember the doc 'The Corporation'? It argued that corporations are like psychopaths. And there was a guy in that doc that stole the show, he was aiming to make his company sustainable, he was different, he was really inspirational, that guy was Ray Anderson.”

How to Complete the MAKE Report

Summary Chart

Directions: In your business profile, you indicated what materials you would need to make your product and whether they came from natural or synthetic sources. You must now look carefully at the processes of making your product and decide which of the 4 conditions (if any) are violated by the “making” of your product:

Recall some of the processes:

- Vulcanization (add sulfur)
- Polymerization (make long chains)
- Plasticization (make into plastic)
- Softening (plasticizers)
- Making it fire retardant
- Transporting the raw materials to where you will make the product
- Transporting the finished product to your market
- Disposing of the wastes that are produced when you make your product
- Using the product over time

Provide more detail in written paragraph form but use this chart to summarize your information. Remember that decision-making might require more information and so you might have to research more about how your product is made.

MAKE Report

Source of 4 guiding ideas: Robèrt, K. (2002). *The natural step story: seeding a quiet revolution*. British Columbia: New Society Press.

<p>The Natural Step Four Guiding Ideas for Decision-Making</p> <p>Does your organization...</p>	<p>Description of violation</p>	<p>List creative options</p>	<p>List + and – impacts of each one</p>	<p>Identify plan you choose (consensus)</p>	<p>Action Plan</p>	<p>Implement Evaluate</p>	<p>Communicate results Reassess the results</p>	
<p>1. ...TAKE substances from the Earth's crust. (metals, petroleum) at a rate that it is too high for nature to put the substance back into the earth's crust?</p>								

<p>2. ...MAKE synthetic substances that cannot be degraded or recycled by nature (ie they are persistent or unnatural) at a rate that it is too high for nature to deal with the substance?</p>								
<p>3. ...physically degrade nature by taking too much (over-harvesting), introducing species to where they are foreign or participate in other forms of modification that nature cannot deal with?</p>								

<p>4. ...try to ensure that human needs are met in our society and worldwide do that everyone can meet their needs worldwide, now and in the future? (over and above just stopping the damage it is presently doing, using resources fairly, efficiently?)</p>								
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1. What is the most difficult part of decision-making?
 2. What is the role of science in your decision-making?
 - *is science needed? A little?A lot?
 - *does science help or hinder (or both) when making these decisions?
 3. DESCRIBE 1-3 main reasons that your business changed what it did?
 4. Did your mental model about how humans take-make-and-waste change from when you were making your organization profile? If so, how? If not, why? Be sure to record any changes on the form
- Changes in Your Organization Profile

Evaluating the Action Plan of YOUR Organization

What do all of your organizations have in common? They are all moving toward sustainability. Evaluate your action plan for moving toward sustainability (so far). This includes discussion of the difficulties encountered.

Communicating The Action Plan to the class

Use the following guidelines to present your organization's action plan for moving toward sustainability. THESE MUST BE SUBMITTED IN WRITING to your teacher BUT can use powerpoint, a public service announcement, a town hall to present the information to your peers...your only limit is your imagination!!

1. Which of the 4 guiding ideas did the company address?
2. The (organization name)(describe what you plan to do)
2. What is the "science" behind what the organization plans to do? (ie why does it work? What background information do you need to allow the audience to understand why it works or why it is a good step toward sustainability?)
3. a) The benefits to human health/well-being include...
b) The benefits to economy include...(your own organization/locally/globally)
c) The benefits to society (locally/globally) include...

Evaluating The Action Plan

Include this in your presentation:

1. Do you think your organization's action plan will be effective?
 - a) Describe at least 3 reasons why it might be effective.
 - b) Describe at least 3 reasons why it might be ineffective.
2. Be prepared to ask your audience their opinions on whether they think the action plan is effective. Be prepared to lead a discussion about the organization.

Listening to Other's Action Plans

As you hear the other presentations you should make notes on each of these items such that you have a record of the action plans of all of the organizations.