

Lesson #1: Project Take-Make-Waste → Organization Profile

Stage 1 – Desired Results	
<p>Established Goals: GLOB: 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</p>	
<p>Understandings: Students will understand that... 1. There are many considerations when beginning an organization including a mental model for the organization.</p>	<p>Essential Questions: SLO C3: Demonstrate appropriate critical thinking and decision-making skills and attitudes when choosing a course of action based on scientific and technological information.</p>
<p>Students will know... 1. Examples of products made from petroleum 2. Considerations that have to be made when beginning an organization, with emphasis on the mental model</p>	<p>Students will be able to... 1. SLO C5: Work cooperatively with others and value their ideas and contributions 2. Describe how the products of organic chemistry have influenced quality of life (C11-5-23)</p>
Stage 2- Assessment Evidence	
<p>Knowledge: Assess whether students can identify at least 10 diverse products that originate from petroleum</p>	<p>Skills: Assess ability to work cooperatively (Groupwork Evaluation) Assess completion of the Organization Profile (see Rubric: Organization Profile)</p>
Materials Required	
<p>Colored Student Magazine: Petroleum: The Source of So Much, 12 pages Source: Petroleum Chemical Foundation (now called Centre for Energy www.centreforenergy.com) Powerpoint Presentation “Examining Our Mental Models” (slides 1 & 2) Powerpoint: Project TAKE-MAKE-WASTE (slides # 1-4) Poster board and markers (to make two advertisements) OR access to computers Handouts: Organization Profile Suggested Headings for Your Organization Profile Rubric: Organization Profile (customized to your wishes/needs with students’ input) Changes in your Organization Profile Internet access 2 Display boards -TAKE, MAKE, WASTE (one for “synthetically produced” products and one for “more naturally produced” products)</p>	
Stage 3 – Learning Plan	
<p>1. Slide 1 – Describe to the class that they will be embarking on a project where they are in charge of an organization that will make a product. It will be a good idea to bring a sample of the product to help get more information about the project for research purposes. DESCRIBE choice of topics: Since the topic they will be focussing on for this unit is organic chemistry, they must choose a product that is hydrocarbon-based. Utilize the magazine Petroleum: The Source of So Much (Source: Petroleum Chemical Foundation). Be sure to discuss who the magazine is written by and their perspective (ie the mental model is that the petroleum chemistry is to be thanked for all of its’ wonderful innovations!) There are also activities suggested in the magazine. Alternately, you might choose to have students think about what product they will choose. Keeping detailed information to a minimum at this point might ensure students do not choose products based on what they think the teacher “wants”.</p>	

2. Divide into groups if/when desired.
3. **Slide 2** - Describe what the expectations are for the organization profile. Field questions. Use the powerpoint presentation titled “PROJECT: TAKE-MAKE-WASTE” (Slides 1-4) to help describe it to the students.
HANDOUTS: Organization Profile
Suggested Headings for Your Organization Profile
Changes in Your Organization Profile
4. You may want to limit choices of products by providing a list of choices. Use the Educator Guide in the Intro section of this binder to help you decide the scope of the products you will allow.
Describe what the expectations of the Organization Profile are.
5. Discuss and fill in the rubric such that it is a fixed scale with specific criteria that describes what performance looks like at each point on the scale. Customize it to your needs and wishes. You may prefer a separate rubric for each of the product advertisements and business advertisements. You may want to emphasize the research portion of the Organization Profile as students learn about how their product is made, what raw materials it requires as this is an essential part.
6. Allow time for students to work on the Organization Profile. The due date for submitting it might be delayed until after Lesson 3: Human and Nature Mental Models of TAKE-MAKE-WASTE so that the ideas of natural and synthetic can be developed.
7. Distribute poster board/markers as needed for the two advertisements. Advertisements could also be done in a powerpoint presentation form if computer access is available.
8. Ensure that students know that they can change their organization profile as long as it is recorded on the handout Changes in Your Organization Profile.
9. **PHOTOCOPY WORK SAMPLES OR ORGANIZATION PROFILE FROM CONSENTING STUDENTS.**
10. Use the display boards to collect ideas/phrases/important visuals (magazine pictures, photos, drawings) that show the contrast between natural and synthetic methods of “taking”, “making” and “wasting” as you work through this learning resource. The display boards are meant to be an organizing feature that is added to throughout the unit. It provides visual images that describe the TAKE MAKE and WASTE mental models of humans and nature

Cross-Curricular

Business Education – defining characteristics of corporations, not-for-profits, co-operatives, etc.

Extension Learning Activities

Notes For Educator for Display Boards

“TAKE-MAKE-WASTE” mental model

(and it is convenient in later discussions to add HASTE to the list ie, we desire polyester rather than cotton because we don't want wrinkly clothing OR we don't want to spend time ironing)

TAKE → what do we need to take from the earth to make this product?

MAKE → what do we do to make this product?

WASTE → how it's parts get returned (or don't) to where they originally came from?

What happens to this product when we deem it no longer usable – ie when it is considered “waste”? What eventually does it break down to?

The idea here is that we take things from earth, we make “stuff” out of it, then we wonder with how to deal with the “waste” afterward. Often we do this with incredible haste – we are even sometimes in a hurry to throw “stuff” out because we have too much “stuff”.

Ideas for the Display Board

Here is an excerpt from my thesis and a chart that suggests possible ideas that might be portrayed on the display boards

Benyus (1997) as described in Porritt (2006, p.166) provides some insight as to the nature of the participatory aspect needed by providing nine “canons of nature’s laws” (on the left of Table 2.1). These are juxtaposed with countervailing generalizations of our human ways as described on the right of Table 2.1.

Table 2.1 Nature vs. Human Nature

Nature’s laws, strategies and principles	Common human response
Nature runs on sunlight	Humankind runs on fossil fuels
Nature uses only the energy it needs	Humankind wastes massive amounts of energy
Nature fits form to function	Humankind forces Nature’s form to fit its own functions
Nature recycles everything	Humankind recycles next to nothing
Nature rewards cooperation	Humankind idolizes competition
Nature banks on diversity	Humankind opts for monoculture, destroys diversity
Nature demands local expertise	Increasingly, the local is lost in a global economy
Nature curbs excess from within	Humankind celebrates excess: greed is good
Nature taps the power of limits	There are no limits, says humankind

Source: Porritt (2006, p.167) adapted from Benyus (1997)

Benyus (1997), the author of Biomimicry: Innovation Inspired by Nature, proposes a “new science that studies nature’s models and then imitates or takes inspiration from these designs to solve human problems. A new way of viewing and valuing nature, it introduces an era based not on what we can extract from the natural world but on what we can learn from it” (as cited in Porritt, 2006, p.166).

This understanding that the only way the “biosphere and the technosphere can coexist is for the technosphere to become biologically compatible with the rest of life on Earth” (Porritt, 2006) is not a fantasy. McDonough and Braungart remind us of the need to become as effective as nature in imitating the cradle-to-cradle systems of nutrient and resource flows (Porritt, 2006, p.174). McDonough’s architectural firm is described in Porritt (2006) as “highly successful and...much sought after by some of the largest companies in the world – even by the Chinese government as they develop comprehensive master plans for a whole new generation of sustainable cities” (p.174).

How to Complete Your Organization Profile

WHAT

Product: (describe it)

Your product must originate from a **hydrocarbon source**. You may propose others and discuss with your teacher whether it would be suitable or not.

Major “selling point(s)” of your product: (create an advertisement and give it to the others in class as a handout on what is great about your product)

Indicate how long the consumer uses your product (on average)

WHO:

Market: (who will buy your product ie what age group, certain groups of people ie sports car owners, new parents? To whom are you aiming your advertisements at?)

WHERE

Location of your organization: (continent, country, community description ie rural/urban)(include rationale ie why you have located where you did?)

HOW

Organization: (Describe how your organization will be run - as a business, a not-for-profit organization, co-operative, corporation, etc. What will the different roles of each person be?)

Raw materials: (what materials the product is made out of, list as many as you can; include references for sources of info)

Classification: (classify the materials into natural and synthetic as well as you can)

WHY

Major “selling point(s)” of your organization: (create an advertisement to post up in the room that provides details on what is great about your company. If you find it helps, you can pretend that you are recruiting people for your business and you are “promoting” your business to them)

Include a MOTTO that guides your organization in the way you make and sell your product (we will call your motto a mental model)

Any other important aspects that you think are important when running an organization:

Suggested Headings for Your Organization Profile

Product:

Market:

Indicate how long the consumer uses your product (on average):

Location of your business (with rationale):

Organization:

Raw materials:

Classification: Natural

Synthetic

Advertisement for Your Product

Major “selling point(s)” of your product:

Include the advertisement itself

Advertisement for Your Business

Major “selling point(s)” of your business:

Motto (MENTAL MODEL):

Include the advertisement itself

Name (s): _____

Rubric: Organization Profile

Name of Organization:					
	1	2	3	4	
WHAT and WHO				Product description is complete; Market provided; How long consumer uses product included	
WHERE				Location given; Rationale given	
HOW				Organization complete including group roles or co-operative structure; Raw materials researched as thoroughly as possible with sources of info referenced; classified as natural and synthetic	
WHY Advertisement for product				Visually appealing Includes "selling points"	
WHY Advertisement for organization				Visually appealing Includes "selling points" Includes motto	
OTHER					

Name (s): _____

Changes in Your Organization Profile

If you want, you can change your business profile. Just be sure to record WHAT you changed and WHY you changed it in the chart below. Add more pages when you need to. If the space is too large, feel free to write two separate changes in one space.

Date	WHAT - Changes to Organization Profile	WHY - Reason(s) it was changed

Name (s): _____ Page 2

Changes in Your Organization Profile (cont'd)

Date	WHAT - Changes to Business Profile	WHY - Reason(s) it was changed

Name (s): _____ Page 3

Changes in Your Organization Profile (cont'd)

Date	WHAT - Changes to Business Profile	WHY - Reason(s) it was changed

Name (s): _____ Page 4

Changes in Your Organization Profile (cont'd)

Date	WHAT - Changes to Business Profile	WHY - Reason(s) it was changed