

Where Does Your Lunch Come From?

Overview

Students will dissect a school lunch to learn which natural resources were used to produce all the items in the lunch. In small groups, students will tell a story with pantomime of the process of resource development and distribution from the source to the end product.



Concepts

1. Natural resources are the elements of the natural environment that people use or value.
2. People are connected to various ecosystems throughout the world for economic reasons.
3. Resource development and distribution is a complex process that generally involves many steps.

Time

1 hour and 20 minutes

- Lunch Dissection: 20 minutes
- Poems: one hour (can be performed at different times)

Materials

For the whole class:

- one entire sack lunch
- world map
- performance space (the front of a classroom or outside)

For each group:

- copy of poem (four different poems)
- signs to label actors in poems (optional)

For each student:

- Ecosystem Explorations Journal

Teacher Preparation

1. Pack a sack lunch (sandwich, napkin, sandwich bag, soda can, fruit, etc.).
2. Copy each of the poems located at the end of this lesson.
3. Optional: Make signs to label the different characters in the poems or have each group make their own signs.



Background

The term natural resource describes the elements of the natural environment that people use or value. Some people find economic value in the production and sale of lumber, others might seek academic gain in the study of wild animals, still others might value natural areas for the solitude they offer.

Some natural resources are unlimited and others are easily replaced. We will not run out of sunlight; oxygen is made by plants. Resources that are constantly replenished are called renewable resources. Other nonliving resources are available in finite amounts. Non-renewable resources are resources that, once used, cannot be replaced. There is only so much oil, coal, and water underground; it will take the earth millions of years to replace what is used, therefore, they are non-renewable.

People are key players, not only in their surrounding ecosystems, but also in every ecosystem to which they are connected. For example, if a person buys a rocking chair made from a tropical hardwood, he or she is connected to the ecosystem that the tree grew in. That person is also connected to the ecosystems that contribute to the labor, tools, and transportation used to build the chair and get it to their home. The packaging materials originated in yet another ecosystem. Indeed, the way we connect to ecosystems through our use of resources is very complex.

Procedure

Lunch Dissection

1. Review the term “ecosystem” with your class.
2. Write the words “natural resource” on the board and explain that a natural resource is something from the natural world that is used or valued by people. For example, trees are used by people to make paper, oil is used to make plastics and gasoline, and wild birds are used by bird watchers for enjoyment. Explain that some resources, like sunlight, are constantly available; other resources like oil are in limited supply. Many resources, like trees and water, are renewable, given the right amount of time.
3. Use the following questions to direct a short class discussion on resources:
 - What resources do we use?
 - What resources do we need to use every day?
 - What materials are used to make the things you use?
 - Where did these materials come from?
 - Which of these resources are renewable and non-renewable?
4. On a table in front of the class spread out all of the contents of a brown bag lunch.
5. Have the students identify the different parts of the lunch. Write this list of items on the board. Include the food items, the packaging, and any other items present (like utensils).
6. Explain that most items in an average sack lunch went through a long process



starting as a resource in an ecosystem to becoming part of their lunch. Some parts of the school lunch are connected to the natural world in the following ways.

- Bread, mayonnaise (vinegar and vegetable oil), mustard, lettuce, carrots, and cookies contain plant material. Plants need water, sunlight, healthy soil, air, and space.
 - Paper bags and napkins come from trees. Trees need water, sunlight, space, air, and healthy soil.
 - The plastic sandwich bags and plastic soda bottle are made from oil. Oil is found underground.
 - Lunch meat, cheese, and mayonnaise (eggs) came from animals. Animals need space, food (plants), shelter, and water.
 - Most of the beverages came from water (either underground or in a reservoir).
 - Aluminum (cans) is produced from bauxite, a mineral mined in Jamaica and Brazil.
7. Refer to the following Ecosystem Resource Table to discuss how one element of the school lunch is connected to an ecosystem. A world map will make it much easier for students to understand the complex processes involved in the consumption and distribution of natural resources.

Ecosystem Resource Table		
Ecosystems	Geographic Locations	Resources
Grasslands	California, Mexico, Great Plains (Illinois, Iowa, Nebraska, Kansas)	Fruit, vegetables, grain
Forest	Pacific Northwest (Washington, Oregon)	Paper
Forest	Eastern USA, Central America	Lumber
Desert, grasslands, ocean	Middle East, West Africa, Texas, Alaska	Crude oil
Grasslands, forest	USA, Central America, South America	Cattle
Rivers, lakes	Global	Water
Forest	Jamaica, Brazil	Bauxite (aluminum)



Poems

Students will tell the story of the production of a resource by reading a poem and pantomiming the different characters and their actions. The following four stories describe the basic journeys taken by the resources that provide us with paper, plastic, aluminum, and food. Each poem includes ten or more characters that aid in the production of the resource. The students may be divided into four groups, with each group responsible for pantomiming one story to the rest of the class. As an alternative, the entire class may work together on one pantomime and perform it for another group of students. Use signs (labeling the different characters) to help the audience follow the story. Props or costumes may be added if time permits. Each group should practice the poem a few times before performing it. Two of the poems are also in Spanish.

1. Divide the class into groups of about eight.
2. Present each group with a copy of one of the poems.
3. Explain that each poem describes the journey of a resource from an ecosystem to our lunch bag (a napkin, a soda can, a plastic bag, and sandwich bread).
4. Give each group twenty minutes to read over the poem and decide how to present the poem to the rest of the class. Students will pantomime the poem and one (or more) student(s) will read the poem. Provide an opportunity for each group to practice. The specific characters are in bold type in each poem. Each person may need to be more than one character.
5. Have each group present their story to the rest of the class. While watching the performance, other groups should use their journal to keep track of the number of characters and roles of the characters responsible for the production of each resource.

Closure

Discuss these poems with your students.

- Where did you think the (napkins, aluminum, plastic, food) came from?
- In what ways were the ecosystems affected in the areas where these resources originated? [Loss of trees, roads built to transport goods, wells drilled, open mines, pollution from mines and factories, land cleared for farms, loss of habitat]
- Are there enough resources to supply every person on the Earth forever? [No. Oil, clean water, and healthy land are all limited.]
- Where do different items end up after we are finished with them?
- Where does our garbage go? Does our garbage take up space? Is there a lot of open space in town to fill with our garbage? [Our waste ends up at the dump. Space for garbage IS a problem everywhere. The less we throw away, the less space our garbage takes up.]
- What are some smart ways you can use things that are made from natural resources? [Don't buy things that you don't need. Use reusable containers when packing a lunch. Eat all of the food that you take; don't throw away



potential leftovers. Recycle all that you can. There are places in Albuquerque that will recycle aluminum, paper, cardboard, glass, and some plastics. Thrift stores will buy and recycle clothes and household goods.]

The connections between people and different ecosystems are very complex. Each person is capable of making responsible choices concerning the use of resources. Some resources can only be produced at the cost of polluting the environment. Some resources are vital to the well being of our society. We need to understand where our resources come from to make the best decisions about how we use those resources.

Adaptations for Students with Limited English Proficiency

When grouping students make sure there is a bilingual student who can help with understanding oral English instructions. During the lunch dissection, draw pictures on the board or use illustrations to show the connections between the source and the end product. When using the Ecosystem Resource Table, use pictures and maps to define the words. Encourage groups to make their projects and presentations bilingual. Encourage students to act out the different parts of the processes as best as possible so that understanding of the complete process is not dependent solely on the narration.



Key Words: natural resources: los recursos naturales; renewable resources: los recursos renovables; non-renewable resources: los recursos que no son renovables.

Journal Exercise

Have students compile a list in their journals of the items that they throw away during two days. The list should include everything that is thrown away at home as well as at school (wrappers, food scraps, newspapers, etc.).



Assessment

Students can be assessed by their participation in the pantomime and through the journal activity where the students record the number of characters and roles in the other groups' poems.

Extensions

1. Have the different groups present their stories and pantomimes to students in other classes or in other grades. Ask students to research the ecosystems from which we get our natural resources. Students could collect and share current events pertaining to our use of natural resources.
2. Have students learn about New Mexico's natural resources and their uses.
3. Examine the things that the class uses. Are there ways that the class can use less? Are there items class members can use repeatedly? Are there items that need not be used at all? Have students list in their journals what they can use less of, use again, not need, and recycle. Also see the *Sandia Mini-Curriculum* activity "Take out the Trash."
4. Use the internet and other resources to compare the U.S. with other countries in terms of resource use.



“Tree Kissers”

By Christopher M. Peknik

14 Characters: Narrator, “You,” Seed/tree/napkin (one character), Lumberjack, Truck Driver, Mill Operator, Wood-scrap Collector, Truck, Pulp Maker, Paper Maker, Shipper, Distributor, Store Owner, Shopper

When there’s a dollop of pudding perched on your lip
Do **you** clean it with your sleeve or a dirty Q-tip?

“I use a NAPKIN!” you shout out with glee.
But did you know a napkin once was a tree?

Two hundred years ago a seed hit the ground
And grew in a forest with trees all around.

This tree grew tall as trees often will,
In a northwestern state, upon a large hill.

Trees give us wood and wood is a resource.
And we need to use more than what drifts on to seashores.

We use wood to make furniture, houses, and floors,
Chopsticks and rowboats and even front doors.

Wood makes it possible for paper to exist
For tissues and books and grocery lists.

In order to simplify and not to confuse,
Our story will stick to the napkins we use.

Two thousand miles away grows this tree, until one day
When a **lumberjack** came to take it away.

The lumberjack cut as if removing a cavity.
A lumberjack, a saw and something called gravity.

Big pieces of tree were loaded onto a truck,

And the **truck driver** left, hoping not to get stuck

The truck driver gazed right over the hood
At a wood mill, which is a factory for wood.

The **mill operator** was busy and rarely was bored
As she saw the saw saw the tree into board.

You can probably imagine all the wood scraps,
Well, a **wood-scrap collector** takes care of that.

Wood scrap collectors make the big bucks
By collecting the scrap and filling more trucks,

And shipping the cargo to plain factories:
Paper mills, we call them, make paper from trees.



“Tree Kissers” continued

A **pulp maker** is part magician, part cook,
Turns part of a tree into part of a book.

Wood bits, water, and bleach make pulp real;
Blend these together, and it resembles oatmeal.

Next to the **paper maker** goes this pulp all clean.
The paper maker pours it over large screens.

The pulp is pressed down, then dried into sheets,
Which are cut into napkins to be used when you eat.

It has to be folded and put into packages.
Factories workers all over do jobs such as this.

The napkins are put into boxes of cardboard,
Still another item that’s made out of wood.

A **shipper** sends the napkins somewhere, of course.
A mighty long journey for this valued resource.

A **distributor** gets them and calls the owners of stores,
Says, “I’ve got some napkins. Do you need some more?”

Store owners buy ‘em and put them on racks.

At last **shoppers** buy ‘em and put them into their sacks.

The entire story of the use of this tree
Took hours of time and much energy.

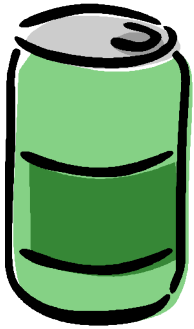
So the next time **you**’re messy when taking your sips,
Think of the tree that’s kissing your lips.



“Doing the Can-can”

By Christopher M. Peknik

13 Characters: Narrator, “You,” Bauxite/Alumina/Aluminum (one character), Bulldozer, Truck #1, Processing Plant Operator, Truck #2, Refinery Worker, Smelter, Aluminum Molder, Can Filler, Shipper, Store



‘Twas half way through lunch, and **your** mouth was quite dry;
Lucky, you had a new soda to try.

You gulped from the can, which was quite good and fun,
And wondered out loud, “what’s aluminum?”

Aluminum is a metal used all over the place
To make foil and cans and rockets for space,
And cars, road signs, lawn chairs, and planes
Refrigerators, doors, and large window frames.

It all started out as a sort of a stone,
A stone that’s called **bauxite** that’s found far from your home.

Most bauxite is located deep in the ground,
Which means **bulldozers** doze where bauxite is found.

The rock is then loosened by explosives below,
And into the back of a **truck** they will go.

A **processing plant** has the responsibility
To crush the rock up and make it look pretty.

Again the bauxite, all clean and all crushed,
Is put in the back of another large truck.

It is shipped all around, over land, over sea,
Until it falls into the hands of a refinery.

The **refinery workers** remove the unneeded rock,
And powdery metal is what they like a lot.

This new substance, **alumina**, is taken away
To a **smelter** for melting sometime the next day.

The smelter then melts it into a metal
And stores it awhile inside a great kettle.

Please don’t think that this story is dumb,
For now you see we’ve just made **aluminum**.

But this aluminum is still liquid, and in no way a can,
More work is required to finish the plan.



“Doing the Can-can” continued

The aluminum travels just down the street,
Where it is **molded** and cooled into large blocks or sheets.

These can be hammered or re-melted or squeezed
Into a variety of objects – whatever you please.

But that can you just drank from wasn't just made,
It was filled with a cola or pink lemonade.

These cans were filled by a **woman** or **man**,
And no can can hold soda like a soda can can.

Our story continues all day and all night,
Cans are being filled and painted just right.

And **shipped** to the warehouses and shipped to the stores
And shipped to far places for sale once more.

So next time you put a can to your mouth,
Think of what happened up north and down south

The things that we use were not made for free,
We use bulldozers and trucks and electricity.

Let's remember to use less, and recycle, and think
About how we are connected to the grand scheme of things.

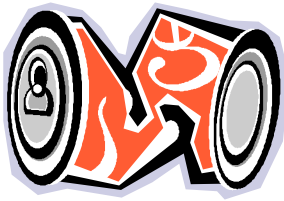


“Bailando el Can-can”

Por Christopher M. Peknik

13 personajes: Narrador, “Tú,” Bauxita/Alúmina/Aluminio (un personaje), Excavadora, Camión #1, Operador de planta procesadora, Camión #2, Trabajador de refinería, Fundidor, Moldeador de aluminio, Envanvío, Almacén

Era casi hora del almuerzo, y la **tú** boca seca ténias,
Por fortuna y por probar ya un nuevo refresco había.



Tomaste de la lata, lo que fué de regocijo
Y en voz alta divagabas, “¿aluminio?” “¿que dijo?”

Aluminio es un metal utilizado en doquier,
Para hacer láminas, cohetes espaciales y latas a placer,
Y coches, señales del camino, sillas de patio y aviones,
Refrigeradores, puertas, y marcos de ventanas a montones.

Todo empezó como una variedad de roca,
Que puede encontrarse lejos de tu hogar y a la cual por nombre **Bauxita** le toca.

La mayor parte de Bauxita en la profundidad de la tierra se puede localizar,
Lo cual significa que la **excavadora** excave donde la bauxita se puede encontrar.

La roca es luego por explosivos aflojada,
Y en la parte posterior del **camión** es transportada.

La planta procesadora tiene la responsabilidad
De la roca triturar y volverla una beldad.

Nuevamente la bauxita, toda limpia y triturada,
En la parte posterior de otro gran **camión** es colocada.

Es enviada a todas partes: ya por tierra ya por mar,
Hasta que a una refinería la bauxita va a parar.

Los **trabajadores de la refinería** le quitan lo innecesario,
Y el metal polvoso quieren, es lo que ellos hacen diario.

Alúmina es la nueva substancia y se lleva por consiguiente,
Para que sea fundida, en la fundición a día siguiente.

El **fundidor** de inmediato en un metal la convierte
Y la pone en un perol y por un tiempo la mantiene.

Y no creas por favor que esta es una tonta historia,
Pues **aluminio** hemos hecho y esto es para vanagloria.

Pero este aluminio aun está en forma líquida, y no en lata,
Más trabajo se requiere para finiquitar la lata.

El aluminio viaja y por la calle es transportado,
Al lugar donde es **moldeado** y en grandes planchas enfriado.



“Bailando el Can-can” continuado

Estas pueden ser martilladas, prensadas o refundidas,
En una variedad de objetos—cualquier cosa que sea pedida.

No fué acabada de hacer la lata de la cual tomabas,
Llena estaba de refresco de cola o de limonada.

Estas latas envasadas fueron por un hombre o una mujer,
Y contener el refresco ninguna otra lata puede
Como una lata de refresco lo puede hacer.

Nuestra historia continúa de día, de noche y en forma constante,
Las latas son envasadas y pintadas justo en este instante.

Y enviadas a los mercados y puestas en almacenamiento,
Y enviadas a lejos lugares para venderse por cientos.

Así es que la próxima vez a tu boca una lata lleves,
Piensa en lo que pasó en el norte y en el sur.

Todas las cosas que usamos no fueron hechas gratuitas,
Usamos excavoras, camiones, electricidad—y no por causas fortuitas.

Recordemos usar menos, reciclar, y pensar en forma exhaustiva,
Sobre de como estamos unidos al gran esquema de la vida.



“It Takes a Planet to Make Plastic”

By Christopher M. Peknik

16 Characters: Narrator, Geologist, Oil/Plastic/Bag (one character), Builder, Driller, Engineer, Truck Driver #1, Ship, Processor, Truck Driver #2, Bag Maker, Bag Packer, Distributor, Driver, Store Manager, Person

I will tell you the story of where we get plastic,
It is really amazing and truly fantastic.

Plastic is a product used by all of us
For TVs and phones and seats for the school bus.

And for furniture, shoes, and clothes that are tacky
And in the case of this story: for clear sandwich baggies.



Plastic is made from a resource called oil,
Which can be found in some places deep under the soil.

Alaska and Texas supply oil to our land,
But this story takes place beneath Arabia's sands.

First a **geologist** had to poke in the ground
In order to find where the oil is found.

A **builder** showed up and put up a well,
And a **driller** drilled down for that oil to sell.

An **engineer** made sure that everything worked,
And in a nearby parking lot, some **truck drivers** lurked.

The drivers ship the oil to a **ship** called a tanker

Which exits the port after it picks up its anchor.

This ship full of oil gets into motion
With hopes that no oil spills into the ocean.

Upon its arrival in the United States,
The oil, again, is taken away.

A **processor** gets some, and the change is quite drastic:
It begins as dark liquid and ends as clear **plastic**.

More **truck drivers** drive the plastic to factories
Where **bag-makers** make small plastic baggies.

Of course not all this plastic is used to make **bags**;
It becomes toothbrushes, Band-Aids, carpets of shag.

And toys and sponges and fake rubber minnows,
And eyeglasses, markers, and envelope windows.

A **bag packer** then packs the bags into boxes.
The **distributor** orders them to fill the warehouses.



“It Takes a Planet” continued

Once ordered, a **driver** takes them away
To the **store manager**, who puts them in the store, on display.
A **person** then buys one, or more likely, a bunch,
And remembers to use them when making your lunch.
Finally, after much time and energy,
The oil becomes a place for your sandwich to be.



“Se Lleva un Planeta para Hacer Plástico”

Por Christopher M. Peknik

16 personajes: Narrador, Geólogo, Aceite/plástico/bolsa (un personaje), Constructor, Taladrador, Operario, Camionero #1, Buque, Procesador, Camionero #2, Obrero, Empacador, Distribuidor, Chofer, Almacenista, Persona

Te voy a contar la historia de dónde obtenemos plástico,
Es realmente sorprendente y verdaderamente fantástica.

Plástico es un producto por todos nosotros usado,
Para hacer asientos del autobús escolar—
Ademas televisiones, teléfonos y no paro de contar.

Para hacer muebles, zapatos, y ropa no muy costosa,
Y en el caso de esta historia para bolsitas de emperedados.

El plástico hecho está del recurso aceite llamado,
Y en la profundidad de los suelos éste puede ser encontrado.

Alaska y Texas de aceite a nuestra tierra abastecen,
Pero bajo las arenas de Arabia, esta historia acontece.

Primero un **geólogo** en el suelo tuvo que excavar
Y así localizar donde el aceite se pudo encontrar.

Enseguida un **constructor** un pozo él instaló,
Y para ese aceite vender un **taladrador** perforó.

Un **operario** se aseguró que todo eso bien marchaba,
Y en un cercano estacionamiento los **camioneros** acechaban.

Los camioneros llevan el aceite a un **buque** petrolero,
El cual del puerto salió después que el ancla elevara.

El buque lleno de aceite se empieza a movilizar
Con la esperanza de en el océano el aceite no derramar.

Al llegar a Estados Unidos,
El aceite nuevamente es transportado.

Un **procesador** procesa un poco y el cambio es muy drástico:
Empieza en un líquido oscuro y termina en un claro **plástico**.

Más **camioneros** llevan el plástico a las fábricas,
En donde allí los **obrerros** bolsitas de plástico fabrican.

Pero por supuesto no todo este plástico se usa para fabricar **bolsitas**,
Se convierte en cepillos dentales, lanudas alfombras y también curitas.

Y juguetes, esponjas y pecesitos de goma,
Y lentes, marcadores y ventanillas de sobres.

Enseguida un **empacador**, de bolsas las cajar llena,
Y para llenar las bodegas el **distribuidor** las ordena.



“Se Lleva un Planeta” continuado

Una vez que son ordenadas las lleva el **chofer** transportista
Y en la tienda en exhibición las pone el **almacenista**.

Una **persona** luego compra una, o más, probablemente un montón,
Y cuando tu almuerzo hagas recuerda usarlas sin condición.

Finalmente, después de energía y mucho tiempo,
El aceite se convierte en un lugar

Para que tu emparedado guardes y lo disfrutes contento.



“Dough Nuts”

By Christopher M. Peknik

18 Characters: Narrator, “You,” Farmer, Mail person, Wheat/flour/dough/bread (one character), Train, Oil, Yeast, Truck(s), Well-driller, Water, Driller, Cook, Mixer, Baker, Twist-tie Twister, Truck driver, Store

Bread, bread, beautiful bread.
On it, creamy peanut butter is spread.
Or maybe some tuna or a thick slice of ham,
With pickles or mayonnaise or maybe just jam.



Could be about anything, but whatever it is,
You gotta have bread when you eat a sandwich.

This bread doesn't just grow out of the floor
Of your friendly neighborhood grocery store.

Our food came from somewhere, some place far away,
Many things happened to bring it our way.

This tale could be told about any old food,
But to keep things clear, it is bread that we choose.

Imagine a **farmer**, speaking into a phone
Ordering seeds for plants soon to be grown.

The **mail person** arrives with bags full of seeds
That need to be planted; there are people to feed.

The farmer grows **wheat** and he's taking his chances
That his wheat will grow tall in these fields of Kansas.

At the end of the summer, after the last rain,
The wheat grain is collected, and put onto a **train**.

The train chugs away for minutes and hours.
So the grain on this train can be ground into **flour**.

In addition to flour, to make bread, you need **oil**.
This oil is from plants, not from under the soil.

Those plants had to be grown, some corn and soybeans,
Which means more energy used by more human beings.

These plants are also taken to some other place
To be cleaned and sorted and processed and changed.

Perhaps the ingredient in bread that we expect the least,
Is a type of a fungus, something called **yeast**.

Not many know where we get our yeast at.
Yet, without yeast in our bread, our bread would be flat.



“Dough Nuts” continued

More people, more trucks carry this yeast to and fro.
I betcha didn't know you needed so much for **dough**.
To make this stuff, bread, for your son or your daughter
You do need to use a whole lot of **water**.
Just think about water and the places it's found
In the oceans, the sky and deep underground.
To make this rhyme simple, and not cause you to stir
From the ground comes this water, from a deep aquifer.
A well is **drilled** deep as people move 'bout;
A pump and some energy gets the water pumped out.
Through miles of pipes this water does flow
It unites with the ingredients to make the bread **dough**.
What of those vitamins your body is craving?
The **cooks** add some thiamin and also riboflavin.
Where these things come from is anyone's guess
But to get them requires more energy, not less.
A **mixer** mixes it up in a large sort of bowl,
Then hands to the **baker** small chunks of dough.
Into giant ovens this **dough** is then fed,
To come out the other side as fresh loaves of bread.
This story goes on. Does it ever end?
It still must be sliced, and packaged, my friend.
And put into boxes all ready to send,
And someone to twist a **twist-tie** to the end,
And loaded onto the **truck** that the **truck driver** drove
To the **store** where they rest with some other loaves.
This story isn't simple. Oh no, sir-ee!
People and fuel and electricity
All played a part, or two, if you wish
In the making of the bread that makes your sandwich.

