

The Life of a Hamburger

Time: 40 minutes

Objectives:

- Students will demonstrate awareness of the chain of environmental impacts caused by the creation of a product.
- Students will be able to explain what portion of a product's life cycle is household waste
- Students will be able to name a minimum of two stages of a product's life cycle.

Vocabulary:

- Chain of production
- Extraction
- Production
- Resource
- Waste
- Disposal
- Raw materials

Materials/Set up

Each corner of the room has a colored card on the wall (in preparation for the group activity)

Blue
Light Blue
Green
Red
Yellow

Chain of Production Cards

Cards will be different colors according to the particular chain.

Cards will be:

- Green: Packaging & Napkins
- Yellow: Burger
- Blue: Fresh Condiments
- Light Blue: Processed Condiments, packaged
- Red: Buns

Each card will have symbols representing energy use/resources at that stage

- Water use (drop)
- Pipeline (pipeline symbol)
- Electricity (pylon)

Each card will have the life cycle stage of production noted on it

- Materials Extraction
- Production
- Transportation
- Use
- Disposal

Introduction (5 minutes)

Teacher introduces:

“We are all familiar with the fact that lots of things go into creating a product, but do we ever think about how many places or people are impacted, both positively and negatively?”

“Everyone is going to be given a card with a picture and title. Each card represents part of a chain production. Can anyone tell me what a chain of production is?”

LandLearn NSW defines a chain of production as: “Basically a **production chain** is the steps that need to be taken in order to transform raw materials into goods which can then be used by consumers such as you and me.”

“These chains of production are for a product familiar to all of us. The cards are in different colors, each color represents different chains of production that collectively produce one item. Your job is going to be to find the other people in the same color group, to put your part of the chain together and tell the story. Example: Students with a blue card find other students with the same color of blue card. (There’s a light blue and medium blue, so find the one matching your card.)

“After we have told the story of the product, we will work on some questions as a large group.”

Activity (15-20 minutes)

1. (2-3 minutes) Everyone receives a card with an illustration of a component of the chain production of a hamburger. [Note: With less than 25 students, students may be given two cards (or more) from the same group. With more than 25 students, you can add group leaders, recorders, reporters.]
 - a. Students are asked to locate their component group, according to the color of their card. Each color gathers in ‘their corner’.
 - b. Groups are:
 - Fresh Condiments - Blue
 - Plastics for Packaged Condiments - Light Blue
 - Buns - Red
 - Hamburger - Yellow
 - Paper Packaging - Green
- Let students know that they are to arrange themselves in the correct sequence, but that two people, transportation and disposal, might be involved more than once - they might need to move around! The students are told to prepare ‘telling their story’ to the whole group - what is your final product, and what steps were taken to get there?
- (2-5 minutes) Students arrange in correct sequence within the group.
- (2-5 minutes) Small group discussion about what happens in each chain of production. Students are tasked to be prepared to quickly tell their part of the story, including each stage of production as noted on the cards.
 - For example: The green card students might say, “The trees are in the forest. The trees are cut down and transportation is used to take them to the paper factory for manufacturing. Parts of the tree that aren’t used are thrown

- away. The packaging is made, and transported to a fast-food restaurant. A customer buys the hamburger, eats it, and throws away the packaging.
- (5-7 minutes) Each group shares their story to the large group.
 - Teacher calls out each color to go in order.
 - Green - Blue - Light Blue - Red - Yellow
 - As each group finishes, the final (use) product(s) are asked to go to a different area than their original group and stand together.
 - The teacher can, time permitting, extend thinking by asking questions about stages, resources, etc., to include asking where additional transportation or waste might occur.
 - The class is asked what all of these products will make in the end - a hamburger!
[Note: the accompanying PowerPoint shows a Hamburger on the first screen. You can choose to click through to show each of the five components to match the groups - fresh condiments, plastics, buns, patty and paper packaging.]
 - Teacher points out how few people make up the final product, compared to all of the parts of the chain of production that we forget about. S/he reiterates the point by showing the parts on the PowerPoint.
 - On the Hamburger picture, each click will bring up each of the components.
 - Students keep their cards and are sent back to their seats.

Discussion (5-10 minutes)

The teacher will now engage the students in large group discussion to assess their understanding, and to help clarify concepts.

- Teacher asks each student to look at their card. The teacher will ask them to find the life cycle stage as noted on the card. The teacher explains that there are several different stages and we are going to see which part of each chain of production is what stage, and what that means. The teacher asks the students to stand up when their stage is called. [Note: The accompanying PowerPoint may be used, and has each life-cycle stage with both title and definition, as well as vocabulary involved.]
 - Who has MATERIALS EXTRACTION? Stand up if you do.
 - Who can tell me what a raw material is?
 - What do you think extraction means?
 - Teacher listens to answers.
 - Students look at the different cards with materials extraction, and see if they can determine meaning.
 - Explain/define vocabulary.
 - Natural resource
 - Raw material
 - Extract
 - Extraction
 - [See PowerPoint for definitions]
 - Who has a card that shows PRODUCTION? Stand up if you do.
 - Can anyone explain what they think that this means?

- What are some of the different cards that we see standing?
 - What do you think that this stage includes?
 - Explain/define stage.
- [See PowerPoint for definitions]
- A lot of these stages also involve TRANSPORTATION. Who has a transportation card?
 - What kinds of transportation do you think are used?
 - Who thinks that they have a card that would involve transportation - perhaps bringing something to you, or sending something away?
- Who has a DISPOSAL card? Stand up!
 - This represents Disposal - and may include recycling, reusing, composting.
- Who has a card that has USE on it? Stand up.
 - What do you think that we mean when we say use?
 - What do these cards have in common?
 - We are looking for the students to see that each of these items are 'stand-alone' products, that are joined together to make the final product (the hamburger).
- Teacher asks the students if there were any surprises - do they have any thoughts about what they just saw/learned?
- Teacher asks the students if they remember what a resource is?
 - Accept answers, give definition again.
 - What are some of the resources that we see on the cards?
 - Do you think that there are other resources used?
 - Explain how there are many more resources at each stage.
 - Ask students to think of examples.
- Large group discussion (brainstorm on whiteboard or flip chart if desired - could choose to use student recorders).
 - What are the common resources are we using? What do we see the most?
 - If we look at the hamburger, in what part/parts of the life cycle do we see waste?

Conclusion (2-5 minutes)

- Review vocab and stages of the cycle
 - Slide with stages of the cycle on it, with icons/drawings/photos representing their cards.

Extension/Cross-curricular Activities

- Using critical thinking, the students are asked to choose a product and determine a minimum of three chains of production used to create the final product.
- Chains of production can be used as a teaching tool for creating web connections or Venn diagrams showing resources used in various chains or stages.
- Students write a description (or create a story) about the life cycle of a product.
- Create life cycle posters.

- Create a scavenger hunt (or have students create a scavenger hunt) in the school, causing them to find different products that use the same (or similar) resources or chains of production.

References

Dow Chemical Company (n.d.). *Life of a hamburger: An exercise in life cycle analysis*.

LandLearnNSW. (n.d.). *What is a 'production chain'*. Retrieved from <http://www.landlearnsw.org.au/production-chains/what-is>

Ryan, J.C., Durning, A. T. (1997). *Stuff: The secret lives of everyday things*. Seattle, WA: Northwest Environment Watch.

Lesson developed by Bridget Bryson, with Susan Salterberg and Carole Yates, Center for Energy & Environmental Education, University of Northern Iowa, Cedar Falls, IA