



Consumption and Waste

The needs of the contemporary consumer are constantly growing in amount and variety and people, consciously or not, are constantly increasing the range of goods and services they use. Transport facilities make it possible for exotic and until recently unknown goods to come from distant places and become part of everyday life. The **consumer market** is incessantly bombarded by advertisements for new products and services. Gradually and imperceptibly **consumption** is becoming a very significant part of people's lives, occupying their time, financial resources and minds.



The **production** and **rendering** of various goods and services in the past was once much more labour- and time-consuming. People were aware of the hardship and expenses accompanying the production, transport and distribution of goods and, because of this, an inevitable part of the moral values of the majority was keeping and taking good care of such goods in a way that they could be used longer.

Nowadays, as far as the greater part of humankind is concerned, this is no longer true. The short-lived use-and-throw attitude toward **consumer goods** is a habit adopted by more and more members in contemporary society, which is rightfully called a **consumer society**.

Causes of growth in consumption:

- **Further growth in the use of natural resources and energy.** For example, the amount of the ores and minerals used worldwide is doubled every 15 years.
- **Further release of more pollutants of air, water and soil into the environment.** Household and industrial waste is deposited in refuse dumps; household and industrial sewage is discharged in rivers, lakes and seas; and automobile exhaust and industrial gas emissions are released in the atmosphere.
- **Population growth.** Currently the earth's population is estimated to be over 6 billion people. At the beginning of the 20th century, this was merely 2 billion, and a population of 10 billion is expected for the mid-21st century.



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These are all serious challenges to the **sustainable development** of modern society.

Because of this situation, unlike any other time in history, people must begin thinking about and acting toward the **sensible use** of goods and services. Every human being should acquire the habit of:

- preferring goods which are of higher quality and reliability;
- urging producers to make goods using renewable materials and energy;
- actively supporting the recycling of materials;
- encouraging multiple use of the usable products;
- treating with utmost care and demand the introduction of new natural resources and sources of energy in the production process; and
- encouraging optimal and nature-friendly ways of using transport for the shipment of goods over both short and long distances.



Raw material becomes **waste** as a consequence of various production and consumption processes. Residual by-products from these transformation processes discharged directly into air and water are called emissions. Residuals that are further handled before being discharged are referred to as waste.

Once generated, waste may be reused, recycled, transferred for treatment (to reduce its toxicity), incinerated (to reduce its volume), or buried in landfills.

Lesson plan: Waste generation

Duration	2-3 class periods
Time of year	Any
Place	The classroom
Materials	Polythene bags, protective gloves, glass bottle, plastic bottle, aluminium can, newspaper, pieces of cloth, banana, an iron
Aims	<ul style="list-style-type: none">• To develop observation skills and sensitivity towards waste and garbage• To raise awareness on the character of domestic waste
Methods	Discussion, demonstration, group work, brainstorming, excursion

What is in garbage?

1 Explain to the class that the enormous amount of energy and resources consumed by the society today produces so much garbage that the resulting air pollution, water pollution and acid rain have become serious threats to the global environment. Humans have accumulated more waste than they can properly manage, and may soon be drowning in it.

2 To prove and further explore the statement, organise one of the activities described below:

Variant I: Who pollutes the school? Give the students paper or polythene bags and protective gloves. Have the students gather the garbage thrown in and around the schoolyard.

Variant II: What can be found in the rubbish bin? Explore the content of rubbish bin in your classroom.



3 Gather everything together and divide it by basic material (e.g. metal, paper, organics, plastics, glass). Divide the class into five groups and give each group a copy of the worksheet Our rubbish? Have groups fill it in.

4 Show the class a glass bottle, a plastic bottle, an aluminium can, a newspaper, a piece of old cloth, banana peel, and iron waste. Ask the students if similar waste is produced by their families, and about other types of waste they can think of.

5 Draw attention to the fact that, once disposed in a landfill, some materials will never degrade. Ask the questions:

- Which of the materials will not degrade?
- Which material will degrade first?
- For which of them will the degradation process be longer than usual?
- Which of them could be reused or recycled? Organise a brainstorming session to discuss the activities that should be undertaken for:
 - glass bottles (collected, washed, turned in for reuse);
 - plastic bottles (collected, sorted, turned in for recycling);
 - aluminium cans (collected, crushed to reduce volume, turned in for recycling);
 - newspapers, pieces of cloth, iron (collected, turned in for recycling).



Help them to see that the gathering and treatment of waste requires the participation of the entire society – starting with the families who can separate their waste at home and bring them to the companies specialised in waste management and recycling.

Other activities

- Give students the worksheet Rubbish at Home and ask students to explore the waste generated by their families in one week. In a week, ask several volunteers to present before the class the results obtained and discuss which of the materials could be easily reused or recycled. Discuss how many families regularly sort their garbage and bring it for recycling.
- Have the students find out places where garbage is disposed of illegally in their home district or near the school. Ask them to draw a simple map of those illegal landfills. Take photos or make drawings of these places. Suggest that they hang them together with the map in a public place (a food store, the municipality building, a health center, or in the school – don't forget to ask for approval of the owners of the building in advance). Try to initiate a public meeting and discussion on the illegal dumping with the participation of neighbours. Remember to invite representatives of the local authorities and journalists.



Lesson plan: The life cycle of materials

Duration	2-3 class periods
Time of year	Any
Place	The classroom
Materials	Fact sheets on the life cycle of paper, glass, organics, plastics, and metals; the story Plums for Litter; dilemma; test
Aims	<ul style="list-style-type: none"> • To raise awareness on life cycle of materials • To spur interest in reuse and recycling of materials
Methods	Association game, group work, demonstration, discussion, brainstorming, dilemma and test solving, artistic reading, performance, show, exhibition

Part I: Life cycle of materials

- Concerns about the growing quantities of waste have become more serious due to the fact that more and more materials have very short life cycles. This is especially true of packaging for everyday products.
- Remind the class of the results of their activities and investigation related to the previous class period, which show that most household garbage can be associated with one of the following five basic materials: paper, glass, metal, organics and plastics.
- Divide the class into five groups and give each group the task of learning more about the life cycle of the above-mentioned five basic materials. Using the scheme and information provided in the fact sheets, give students 20-30 minutes to prepare short performances on what they have learned about each material. Ask groups to pay special attention to existing opportunities to recycle or reuse the materials.
- Give each group 10 minutes to tell the others some facts on the life cycle of their materials. Give the class 5-7 additional minutes for questions and discussion on the issue.



Part II: Garbage festival

- Have students collect various waste materials and objects – cardboard boxes, plastic bottles and cups, aluminium cans, old newspapers and magazines, etc. – that could be used for a “Garbage Festival.”
- Discuss what activities could be included in such a festival (e.g. an exhibition of sculptures constructed from aluminium and cardboard boxes; an exhibition of applications made of paper strips, pieces of cloth or various plastics; a fancy dress ball with costumes made of waste materials or costumes presenting different types of garbage; a concert with students creating original new lyrics connected with garbage for popular melodies, poems and short epigrams.)
- Consider preparing and producing a short play presenting the careless attitude of man toward the waste problem. Don’t forget to add an element of competition to the event.



- 4 Choose the moment of organisation carefully. Invite students from other schools, parents, and representatives of the municipality. Try also to invite local businesses, which may provide some of the waste materials for decoration or with prizes for winners. Also invite journalists, discussing with them in advance the best ways to promote the Garbage Festival.
- 5 Choose the venue for the event carefully. Let everyone see your festival, and be assured that after the event many people will start thinking more seriously about the messages delivered by your creativity and effort.

Part III: Plums for litter

- 1 Read the story Plums for Litter in the enclosed fact sheet after this lesson plan. Discuss the qualities of the young girl in the context of trying to decrease the quantity of garbage produced by man.
- 2 Suggest that the students think about organising a performance using some elements from this fairy tale. An example plan for the organisation of a show is present below:
 - Ask local businesses and funders for cooperation. Encourage them to provide the prizes.
 - Announce a date and time for organisation of the Plums for Garbage action. Summon the people to take part using leaflets, the local newspaper, local radio or TV station.
 - Establish a Plums for Garbage point in a designated area (e.g. the schoolyard). Provide cardboard boxes, using them for different types of waste material: glass, metal, plastics, paper.
 - On the day of the action, take the waste collection process seriously. If possible, provide a scale and weigh what is being brought and write down by whom. Give prizes.
 - Announce the final results and decide whether to give a Best Pollutant or Best Cleaner prize.
 - Do not forget — there must be broad press coverage of your event!

Other activities

- Organise a visit to the landfill in your community. Explain to the students that this place is an essential part of people's everyday life, although not a very pleasant one, and it must be treated seriously. Try to have a municipality officer or a representative of the landfill management company with you. Ask them to tell you about treatment methods for incoming garbage. If no one is present, explain to the class that garbage is transported to the landfill daily. Here it is spread in a layer not higher than one meter and tramped down. On top of each layer is spread soil or some inert material, which is also tramped, keeping the organic material away from birds and other animals to prevent the spread of disease. Modern landfills are to be found in natural pits or caves, the bottom of which is covered with impermeable waterproofing material, which keeps toxic substances from leaking into groundwater. Landfills are surrounded by fences that limit access to people and animals. The buried garbage degrades slowly, releasing gases, and modern landfills have special systems for collecting those gases. After the capacity of a landfill is exhausted, it is covered with a layer of humus and topped with decorative trees. In several years, a young forest grows, making it hard to believe the space had once been a garbage dump.
- Make copies of the six pictures on pages 136-141 and hand them out to the students to colour in.





DILEMMA Camp Rubbish

During a camping trip you notice that another family is going home without picking up the rubbish around their tent. What do you do?

- go to them right away and explain that they should pick up their rubbish before they leave;
- wait for them to leave and then clean up their garbage;
- take down their license plate number and inform the police;
- nothing, it's not your problem;
- something else.



TEST Responsible Consumption

	TRUE	FALSE
1 The growing consumption of goods and services takes people's attention, time and resources at an increasing rate.	<input type="checkbox"/>	<input type="checkbox"/>
2 The growing consumption of goods and services leads to less use of resources and energy.	<input type="checkbox"/>	<input type="checkbox"/>
3 Nowadays most materials can be recycled.	<input type="checkbox"/>	<input type="checkbox"/>
4 The energy for production when recycled materials are used is less than when raw materials are used.	<input type="checkbox"/>	<input type="checkbox"/>
5 Recycling shortens the life of natural resources.	<input type="checkbox"/>	<input type="checkbox"/>
6 Reusing objects many times should be preferred to one-time use.	<input type="checkbox"/>	<input type="checkbox"/>
7 Modern life is impossible without the use of aluminium.	<input type="checkbox"/>	<input type="checkbox"/>
8 If we dump aluminium cans without crushing them, they take up a lot of space.	<input type="checkbox"/>	<input type="checkbox"/>
9 Using a cloth bag when shopping is better for the environment than using plastic bags.	<input type="checkbox"/>	<input type="checkbox"/>






Answer key: 1. True 2. True 3. True 4. True 5. False 6. True 7. True 8. True 9. True



FACT SHEET

Our Rubbish

- 1 Explore the basic materials that the things in your schoolyard and/or classroom are made of:

Basic material	Number of items found in rubbish bin
 Metal	
 Paper	
 Organics	
 Plastic	
 Glass	

- 2 What is the weight of the garbage the class made in one day? (For variant I only.)

- 3 If each class in the school generates this much rubbish, how much is made by all of the classes in one day? (For variant II only.)

- 4 Using the answer given in Question 2 (variant I) or Question 3 (variant II), calculate how much rubbish is made by all schools in your community in one day.

- 5 Calculate how much rubbish is made by all schools in the community in a week of five schooldays and in a month of 21 schooldays?





FACT SHEET Rubbish at Home

Investigate your rubbish at home by putting a large bag next to the regular rubbish bin. Label the bag, "For plastic, metal, paper, unbroken glass bottles, cardboard, and other types of packaging." Ask family members to collect these items in the bag while the other rubbish (food waste, broken glasses, etc.) should be put in the rubbish bin as usual. Continue to separate your rubbish for one week. Insert the facts in the table below.

Materials collected:	Weight or number of pieces
 Glass bottles	
 Plastic	
 Metal	
 Paper	
 Cardboard	
 Other packaging	
 Other materials	

Researcher's name:

Investigation started on: Completed on:

Number of family members:





FACT SHEET Life Cycle of Paper

Waste issues can be better understood by examining the life cycle of the materials that compose it, from extraction to final disposal.

- 1 Paper, invented in China nearly 2,000 years ago, is ecologically sound because it is biodegradable and recyclable. There are more than 3,000 different paper products today.
- 2 The production process is based on the use of timber and involves mixing plant fibre with water, purification, whitening, compression and drying.
- 3 Although there are many various types of paper and paper products, produced in many different ways, basic production methods have remained the same throughout the ages.
- 4 The paper production process has a negative environmental impact, as it releases harmful substances into the atmosphere. The use of bleaching chemicals leads to water pollution.
- 5 Paper production leads to deforestation, followed by the disappearance of rare and endangered species, soil erosion and a decrease in the supply of groundwater.
- 6 About 650,000 tonnes of paper are produced every day worldwide, and 500,000 tonnes are thrown away because they are not reintroduced into the paper cycle.



Ways to help:



Reusing paper products. Using books from libraries, writing on both sides of a sheet of paper, using textbooks for multiple generations of students, and reusing cardboard boxes for various goods all help to decrease the need for new paper products.



Reduction of consumption. Computers can be a powerful tool in the reduction of paper consumption.



Recycling used paper products. The energy needed for the production of recycled paper requires two to three times less energy, and about five hectares of forest are saved per tonne of recycled paper. Air pollution can be reduced by 75 percent and water pollution by 60 percent.

There is no doubt that recycling paper is good for the environment.





FACT SHEET

Life Cycle of Glass

Waste issues can be better understood by examining the life cycle of the materials that compose it, from extraction to final disposal.

- 1 Glass products can be found everywhere in daily life. Bottles, mirrors, windows, eyeglasses and light bulbs are just a few examples.
- 2 Many believe that glass is a modern material, but glass has been used for more than 4,000 years.
- 3 The most amazing fact about glass is that it is not actually a solid substance. It is produced by melting sand (silicon dioxide) at high temperatures (over 1,000 degrees Celsius), followed by rapid cooling which keeps the glass particles from forming the precise structure found in solid materials. In other words, glass is a liquid that has frozen too quickly.
- 4 Used glass is often thrown away together with domestic waste. The problem is that once buried in the ground, glass can exist for millennia without degrading.



Ways to help:



Some glass products may be reused. However, glass bottles must always be cleaned well before reintroduction into the glass cycle.



One of the best solutions is to recycle glass. Although it is a relatively cheap material, a lot of energy is needed for its production, and its cost is constantly growing. Recycling glass reduces energy use by up to 30 percent, while air pollution is reduced by 20 percent, and half as much water is used.

There is no doubt that by recycling glass, we can save a lot of energy.



FACT SHEET

Life Cycle of Plastics

Waste issues can be better understood by examining the life cycle of the materials that are used to make it, from extraction to final disposal.

- 1 Plastic is a synthetic material used in place of materials found in nature. Plastics first appeared at the beginning of the 19th century.
- 2 Today there is an immense variety of plastics, and more often they are recognised by their abbreviations, such as PET (polyethylene, which is used for soft drink bottles) and PS (polystyrene, which is used for yoghurt containers).
- 3 Plastic waste constitutes 10 to 15 percent of the total weight of household waste, and the ratio is increasing.



Ways to help:



Reduced consumption. Shopping with a cloth bag or basket, or choosing soft drinks in glass packaging rather than plastic reduces waste and shapes product supply.



Second use. Many plastics can be cleaned and reused.



Recycling. One of the best ways to deal with plastic waste, recycling can save raw materials (petrol) and energy, as well as reduce pollution of water and air. It is possible to recycle almost every type of plastic. Sorting plastics by type, however, is not always easy. Several large supermarket chains have introduced new equipment to facilitate the process.

By recycling plastics, we create a cleaner environment.





FACT SHEET

Life Cycle of Organics

One of the best and most environmentally friendly ways of treating organic waste is composting. Composting is a process of breaking down organic waste with the help of bacteria, fungi and other microorganisms. The process uses high temperature (up to 65°C) and humidity. The resulting product is called compost, which acts as a fertiliser when added to the soil.

Typical things from our everyday life to **compost** are: fruits (but not citrus fruits) and vegetables, houseplants, grass clippings, leaves, nut shells, animal manure, cardboard rolls, clean paper, coffee grounds and filters, cotton rags, dryer and vacuum cleaner lint, eggshells, fireplace ashes, hair and fur, hay and straw, sawdust, shredded newspaper, tea bags, wood chips, wool rags, yard trimmings, and other natural materials.

Butter, egg yolks, milk, sour cream, yogurt, coal, fats, grease, lard, oil, meat and fish bones, or pet waste are among the materials that **cannot be composted**.

People are rarely aware of the fact that compost can suppress plant diseases and pests, reduce or eliminate the need for chemical fertilisers; promote higher yields of agricultural crops; facilitate reforestation, wetlands restoration, and habitat revitalisation efforts by amending contaminated, compacted, and marginal soils.



Waste issues can be better understood by examining the life cycle of the materials that compose it, from extraction to final disposal.

- 1** A variety of organic products are used in everyday life. Food from the garden and clothes produced from plant material are just a few examples.
- 2** A large part of organic waste from meals, cooking or work in the garden is thrown away together with other household waste. In urban areas, the proportion of organic waste in garbage per family can be as high as 30 to 40 percent.
- 3** There are several alternatives to the disposal of organic waste with other household wastes (use as animal feed, composting, burning, etc). The burning of leaves and other organic waste from the garden, however, contributes to the greenhouse effect by raising the concentration of carbon dioxide in the air.

Ways to help:



Food scraps and yard waste can make your garden grow. After you eat a banana or rake the leaves, don't throw the peel and leaves in the rubbish bin – put them in the compost heap. Plants take nutrients out of the soil, and in a man-made environment these nutrients do not go back in naturally. Farmers and gardeners use artificial fertilisers, but natural humus from a compost heap is far more natural and healthy for the soil. Best of all, compost is cheap.

By recycling organics we can produce compost, which is equally good for the garden and for agriculture.



FACT SHEET

Life Cycle of Metals

Metals have been an important part of civilisation from ancient times to today. Three of the most important metals to us are copper, iron and aluminium.

Thousands of years ago people began to use bronze, an alloy of copper and tin, to make weapons, statues, coins, and other objects. Historians call this period the Bronze Age. The oldest things made of iron are about 6,000 years old. In the 12th through the 10th century BC, iron became the most important metal, so this period is called the Iron Age. Even today, copper and iron (which includes steel and cast iron) are among the most commonly used metals, both separately and as alloys or compounds of other metals. We use copper wires for electricity, steel for making buildings, and cast-iron radiators for heating. The production of goods from copper, iron and their alloys requires great amounts of energy. It is easy to recycle these metals.

Without aluminium, no airplane could fly, automobiles would use much more fuel, and computers and TV sets would not work. Although aluminium is a very light metal, its alloys can be harder than steel. Aluminium comes to Europe from far away, often from Australia or Brazil, which together account for more than 60 percent of the world's supply. Guinea, Jamaica, and Central Asia are also rich in aluminium. One of the most valuable qualities of aluminum is its use in making very thin plates (chocolate bar wrappers, lids of yoghurt containers, soft drinks cans). The production of aluminum and aluminum goods is connected with the use of huge quantities of energy. Aluminum can be easily recycled.



Waste issues can be better understood by examining the life cycle of the materials that compose it, from extraction to final disposal.

- 1 Metals must be melted first.
- 2 To produce a tin, it is necessary to shape the metal as a thin plate (tin-plate). Many metal articles are made by pouring molten metal into a specific cast. This is followed by various processes, which further shape them to achieve the necessary result in terms of dimensions, strength and resistance to external factors.
- 3 The ready articles, which are offered at the market, have various applications: airplanes, cars, rails, nails, wires, bottle and jar caps — the list is nearly endless.
- 4 Many metal articles are prone to change over time and gradually become useless. One such destructive process is corrosion — under the influence of temperature, humidity and the environment many metal articles disintegrate.

Ways to help:



Collect metal for recycling. Mining raw materials hurts the environment and metals are easy to recycle. Many markets already exist for recycled content.



By recycling iron, copper and aluminum, we can save a lot of energy.



FACT SHEET Plums for Litter



There was a man who had a house and a garden. He had a plum tree in his garden and a son at home. When his son turned 20, he decided he wanted to get married.

The father thought, "My son is a good, hard-working boy. I have to marry him to a good girl, so that they are a good match. But where shall I find her?" The old man thought for a long time and finally had an idea. He loaded his horse cart with plums and went round the villages selling them.

He travelled on and on, whipping his horse and shouting out loud: "Plums! Buy plums! I sell plums for litter!"

Women crowded from all around, thinking: "Well, I never! The old man must have gone out of his mind, selling plums for litter!"

Women, maids, young wives all rushed about sweeping their houses. They did their best to gather the most litter so that they could get as many plums as possible. As for the litter, there was plenty! You could see a woman

toting a huge sack, another one with a basket, still another hurrying about with litter tucked in her folded apron.

They were all boasting to one another: "I say! Look how much litter I swept! A good job this fool turned up, so that I may trade it for plums!" and "Don't think my litter is so little! I can bring twice as much. I may not have much in my house, but there's litter galore!"

Another laughed, "If I have to clean for a whole year from now, I wouldn't manage to sweep all the litter! It's kept piling up for so long! I just rushed to fill this sack, because the children want plums."

So the man took their litter and gave them plums. The women were laughing and he was laughing, too. Everybody was as happy as could be. The man filled his cart with litter and his plums were almost sold out.

Eventually, a girl came up to him. She was young and pretty and she had gathered the smallest amount of litter, carrying it in her handkerchief!

"Pretty maid," said the old man. "You have gathered so little litter! How many plums can I give you for a handful of sweepings?"

"Well, good sir," answered the girl, "I am not sorry to part with my litter, but I didn't know where to get any. We have none at home. What I've brought is what my neighbours gave me for helping them sweep their houses."

The old man was very happy to hear this. He could see the girl was clean and hardworking, since not a speck of litter could be found in her house. "She would be a good wife for my son," he thought.

Then he took the girl into his cart and turned the horse to his village. The wedding was arranged as soon as they arrived. He married his son to the pretty girl and was never sorry to have done so. And he has never stopped praising his daughter-in-law.