Class Zero Emission

TEACHING DOSSIER 5

LANGUAGES, GEOGRAPHY, NATURAL SCIENCES

SUSTAINABLE DEVELOPMENT: WHAT IS IT?

SUSTAINABLE DEVELOPMENT, CONSUMPTION, POPULATION, GLOBALISATION, ENVIRONMENTAL IMPACT, ECOLOGICAL FOOTPRINT

THEORY SECTION

WHAT IS SUSTAINABLE DEVELOPMENT?

Many traditional cultures, such as some of the Amerindian tribes or peoples from the Far North, have always granted a great deal of importance to living in harmony with nature. However, this particular concern has never been given much weight in "western" culture until recently. But now, the level of importance we are currently giving to the notion of "sustainable development" shows exactly how things are changing.

BACKGROUND

Ever since the days of the Industrial Revolution, western cultures have been driven onwards by furious-paced development and economic growth, focusing mainly on the production and consumption of material goods. But since the beginning of the 1970s, worries have been expressed about our economic activities and how they are causing visible and localised damage to the environment (waste, smoke from factories, polluted waterways, etc.). In social and economic terms, it was obvious back then that the global policy maintained and even increased the gap between rich and poor countries, with wealthy and impoverished populations living side by side in the same country or region. It was by making these observations that the limits of our society's trend towards development first began to be seen. This led to the appearance of the notion of "sustainable development" (1968: creation of the Club of Rome, which published the first reports on the topic; 1972: United Nations conference in Stockholm on the environment and development).

During the 1980s, the existence of various forms of global pollution and other disruptions to the natural order, such as the hole in the ozone layer, acid rain, climate change and deforestation, was first discovered and brought to the attention of the public. These adverse effects on the natural environment were not easy to identify and their origins were not easy to pinpoint.

In this context of rising awareness the idea of "sustainable development" – something that could both close the gap of social inequality and reduce the strain on the environment – began to gather pace. In 1987, the World Commission on the Environment and Development (Brundtland Report) came up with the first official definition of sustainable development: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs". This definition reflects the same philosophy as an Amerindian proverb: "The earth does not belong to us; it is lent to us by our children".

WHAT DOES IT MEAN TO DEVELOP "SUSTAINABLY"?

The word "sustainable" describes something that can last over time, continuing indefinitely. The association of "sustainable" with the word "development" has often been criticised, because at first sight, the two words seem to contradict one another. Indeed, the aim of economic development (or economic growth), on the one hand, is infinite growth. But on the other hand, we now know that our planet's resources are anything but infinite and so require sustainable management. However, we should not allow this debate about language to obscure the generally positive thoughts put forward by sustainable development.

One simple way of illustrating the sustainable management of the environment is to make a parallel between the Earth and a desert island completely cut off from the rest of the world and inhabited by just a few people. In fact, the Earth itself is a kind of desert island, cut off from everything else in the centre of the universe. Given the scale of a tiny island, the idea of "sustainability" becomes much clearer: for example, if our Robinsons cut down all of the trees on the island to burn them, and if they catch all of the fish in the area because they love fishing, they will very soon place their survival in danger. By contrast, if they are able to use the available resources carefully, they will have enough to live prosperously for many generations to come.

THINK GLOBAL, ACT LOCAL

This catchphrase was used for the first time at the environment and development summit held by the United Nations in 1972. It clearly expresses the fact that the social and environmental issues we are facing today are global in nature, on the scale of the whole planet. By acting locally, however, we can resolve these global problems – provided everyone joins in. The notions of 'solidarity', 'collective responsibility' and 'participation' (see below) that appear as a result are the very bedrock of sustainable development.

SOME OF THE PRINCIPLES OF SUSTAINABLE DEVELOPMENT

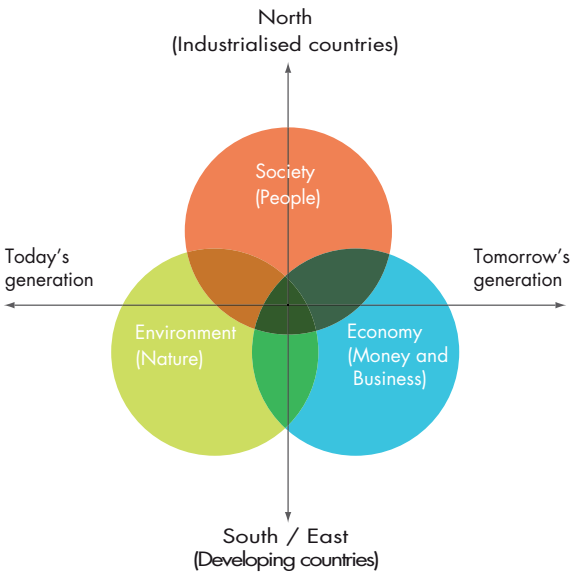
In June 1992, the representatives from nearly 180 countries attending the Earth Summit adopted the "Rio declaration on the environment and development". The basic principles were set out in the declaration, in order to guide political action, laws and regulations in the direction of sustainable development. Here are some of those principles:

- **Principle of precaution**: If there is any likelihood that products or activities might cause serious damage to health or the environment, measures aimed at preventing the deterioration of the environment must be taken quickly, even before having any formal proof of the damage (e.g. by withdrawing a product from sale, limiting the use of some products, banning certain activities, etc.).
- **Principle of economy and good management of resources**: Economies must be made on use of the Earth's natural resources and these resources must be managed in order to ensure their sustainability.
- **Principle of individual and collective responsibility**: Each individual, in his or her individual and collective actions, must take responsibility by being aware of the effects of his or her consumption.
- **Principle of participation**: To guarantee the needs of future generations, it is vital for every individual to become committed personally to sustainable development.

GRAPHIC: THE THREE CIRCLES OF SUSTAINABLE DEVELOPMENT

These days, the notion of sustainable development is known throughout the world and is often illustrated by three circles, each one representing one of the three dimensions - environment, economy and society. These dimensions are placed along axes of time and space (see fig. 1). This illustration summarises the following points:

- The economy, society and the environment are three areas that may appear separate at first glance (outer part of the circles), but in reality, they are interdependent (overlapping part of the circles). In fact, any action taken in one area does have consequences in the two others. This means that they cannot be considered independently from each other.
- The actions we take today can have long-term effects that need to be taken into account. This means we need to start thinking "tomorrow" today.
- Human society needs to be taken as a whole (with the industrialised countries and developing countries mixed together). Yet the way of life led currently in the industrialised countries cannot be transposed to every country on Earth, because our planet's resources would be insufficient to sustain it. Consequently, we need to think about "everywhere", instead of focusing solely on our own region.



➥ Figure 1: Graphic representing sustainable development

EXAMPLE OF A WAY TO USE THE GRAPHIC

This graphic representing sustainable development can be used to analyse any situation by taking the three aspects (environment, society, economy) and their interactions into consideration in turn. These interactions can then be positioned geographically and in time. This approach, which consists of adopting different points of view to analyse the same situation, can be applied intuitively by everyone according to their own scale of understanding. For younger children, for example, the three aspects can be explained by suggesting they put on a different pair of glasses to see each situation from a different angle: "environment" glasses, "money and business" glasses or "people's lives" glasses. Everyone who does this exercise finds that it encourages the emergence "of an awareness and identity as a citizen of the world", which is the aim of sustainable development.

Here is an example of how to analyse a situation using this method (of course this is not a full analysis: there are lots of other aspects that could be raised). We'll analyse the following situation: going shopping at the supermarket.

'Economy' aspect: The supermarket is a business that brings in money to the shareholders and the country. Their aim is to ensure that the products they sell cost as little as possible so that they can make the greatest profit.

'Environment' aspect: The products sold by the supermarket may have been produced in a way that is respectful of nature (local and organic products) or not (products that originate from far away, that required the use of fertilisers, etc.). However, the products grown in a "sustainable" way often cost more than other products.

'Social' aspect: People buy products based on what they can afford and their tastes, as well as according to their wellbeing. For example, they may choose to buy organic products. These are a little more expensive, but there is little chance the products will contain fertilisers, pesticides and insecticides, which may be harmful to health. They may also choose to buy fair trade products which aim to ensure rights and revenue to the producers of the products, enabling them to live properly and with dignity from their business producing food.

Interactions: The supermarkets also need to take account of what the consumers want to find on the shelves to avoid losing customers (social/economy). As a result, shoppers can influence the choice of products offered by the supermarket and hence give preference to products that respect the environment (social/environment/economy).

IS OUR CURRENT WAY OF LIFE SUSTAINABLE?

CHANGE OVER THE PAST CENTURY

Increase in consumption

The world population grew enormously during the 20th century, rising from approximately 1.6 billion people in 1900, to 6.7 billion in 2008. Despite this increase in the population, the standard of living rose a great deal too (at least in industrialised countries), in particular as the result of access to new technologies and a strong economy: appearance of running water, electricity, cars, development of medicine, etc. Consequently, economic growth prevailed during the 20th century, encouraging the production and consumption of material goods. Today, changing our furniture, crockery, clothes, phone or computer on a frequent basis has become part of our way of living. As a result of this, the quantities of natural resources we use every year have continued to grow constantly since the Industrial Revolution: energy sources (oil, gas, coal, wood), metals, water, farmland, etc. (NB: in the case of farmland, although the total area of land cultivated is tending to fall in industrialised countries, it is still growing on a worldwide level).

Globalisation

In the old days, transporting goods was a long and perilous process. So most communities used local resources for their daily needs (food, clothes, building materials, tools, etc). Only a few luxury items were "imported" (silk, tea, coffee, etc.). Since then, systems of transport have developed beyond belief: every day, planes, boats, trains and trucks transport enormous quantities of goods from one side of the planet to the other. These international exchanges of goods are extremely beneficial for the economy and have resulted in international companies being created.

Today, the vast majority of the products we consume come from far away, whereas most of them could be produced locally. This supply paradox can be explained by the low cost of transport combined with the low wages in certain areas of the globe, where working conditions are often appalling. As a result, these days it can be cheaper to buy apples grown in New Zealand than ones grown in the orchard next door. It is also cheaper to send prawns caught in Denmark to be peeled in Morocco and then send them back to Denmark, than it is to do it all in Denmark.[1]

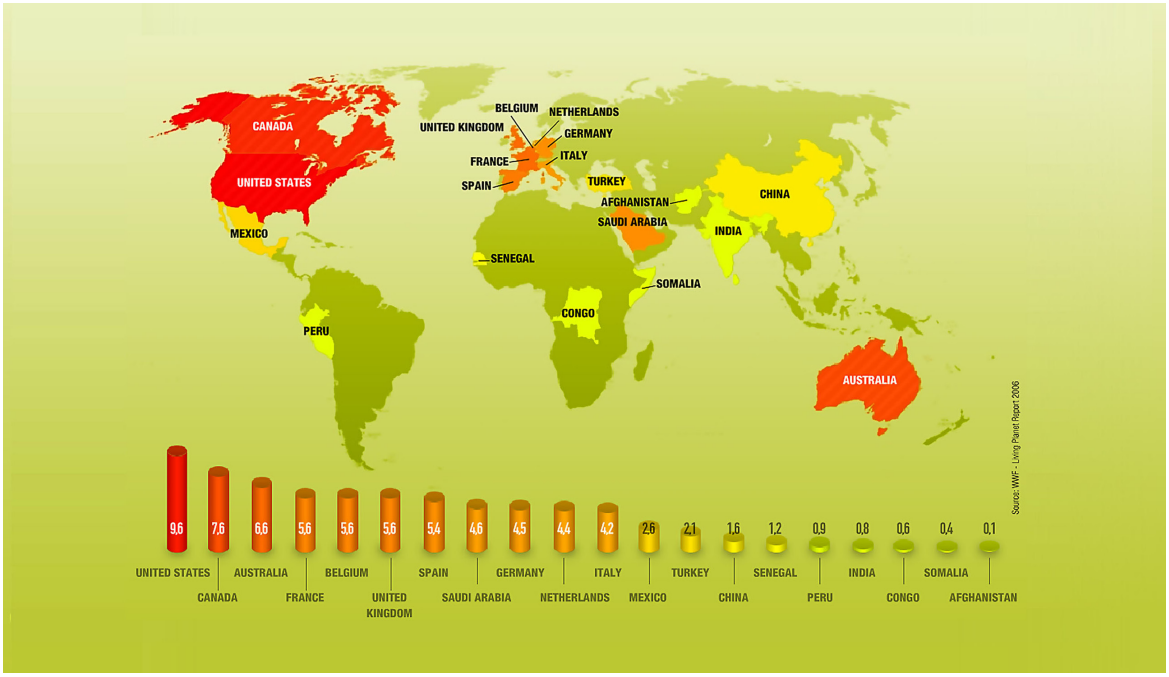
SO, WHERE ARE WE TODAY?

While our current way of living prompts us to keep consuming ever more, there are clear signals that the environment is no longer coping and will not be able to provide us with everything we need indefinitely. Nor is it able to absorb all of the pollution we continue to throw into it (see elsewhere in this file). However, it is difficult to illustrate the situation clearly on a worldwide scale. So, how do we find out whether our day-to-day lives are sufficiently respectful of our environment, or whether we should make changes?

Calculating our ecological footprint[2]

The ecological footprint calculator available on the Internet is a tool that enables each one of us to assess whether our way of living is sustainable or not. The result is expressed in the area (in hectares) required to produce all of the goods we consume and absorb the waste we produce. Although only an approximation and not taking every single element into account, the calculator enables us to see whether the way we live is sustainable or not. And the answer is unequivocal: it's not. Already today the world's population is consuming more than the planet can produce sustainably. And yet consumption continues to rise… The developing countries are seeking to achieve a standard of living that is equivalent to the developed countries (which only seems fair). But if everyone living on Earth consumed as many resources as the people in developed countries, we'd need 3 Earths to meet our requirements!

So we are obviously going to run into a problem. The major challenge for this century will be to incorporate respect for the environment into the way we develop. This will enable us to find a new equilibrium – one that is genuinely sustainable for human beings, as well as for the planet.



↳ Figure 2: Ecological footprint of the various countries of the world. N.B: a sustainable ecological footprint is 1.8 hectares.

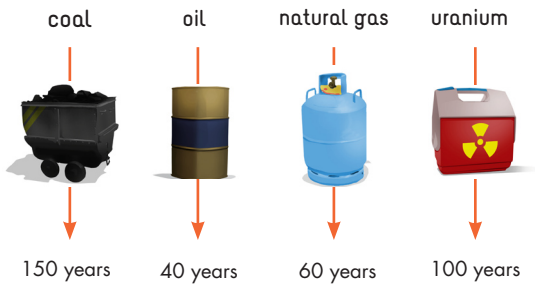
1 Also see the animation on "Managing transport: getting about about with minimum pollution», available free of charge from www.educapoles.org
2 See the animation on «The ecological footprint, a measure that induces to better consumption» at www.educapoles.org

THE EFFECTS OF OUR UNSUSTAINABLE WAY OF LIFE ON THE ENVIRONMENT

So, what are negative impacts of our current way of living on the environment? Here are a number of examples, explained very succinctly.

RUNNING OUT OF RESOURCES

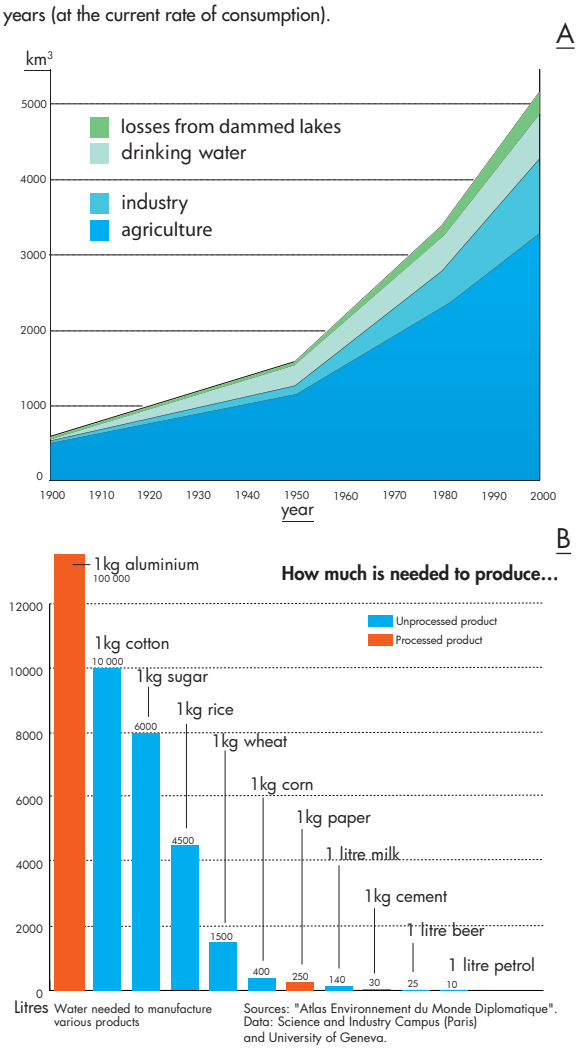
Natural resources can be divided into two categories: finite resources and renewable resources. As the name suggests, finite resources exist in limited quantities on the Earth: they cannot be renewed and will one day run out when we have consumed everything that exists (such as oil and metals). According to the experts, it is probable that reserves of oil and some metals will run out by the end of this century if we continue to consume them at the current rate.



➥ Figure 3: Estimate of the current status of reserves on Earth, expressed in years (at the current rate of consumption).

The resources in the second category renew themselves: they are unlimited, provided we only take a little at a time. This is true of populations of animals or fish, for example. However, if we don't respect the natural equilibrium and take too much, too quickly, these resources may dry up and disappear. This is the case for fish stocks: the volume of fish caught in the world each year rose from approximately 20 million tons in 1950 to almost 100 million in 2004. According to the FAO, 25% of the world's stocks of fish are already being overexploited, and many are at alarmingly low levels. In some regions of the world, this figure may be as high as 60% of all fish species!

Renewable natural resources also include reserves of freshwater or farmland. Although we don't actually "take" these resources out of the environment (farmland doesn't disappear once it has been used and water is discharged into the environment after use), they are used as part of human activities and can be seriously damaged if used incorrectly (pollution of soil or water, deforestation leading to desertification, etc.). Everything indicates that these resources are also being extensively over-used in many areas around the world. Agriculture, for example, has become more intensive with the significant use of fertilisers and pesticides. It is also a fact that the volume of water used and polluted by human activity continues to rise.



➥ Figure 4: The example of water. A. Movements in world water consumption / B. Evaluation of the quantity of water required to manufacture certain products

POLLUTION

Some types of pollution released by human activities could probably be absorbed by the environment if they were produced in small quantities. But the volume of pollution being produced today is so gigantic it is disrupting the environmental system as a whole. Waste, chemical substances, greenhouse gases and micropollutants all collect in the environment and cause major damage to the flora and fauna. In addition, the greenhouse gases released by human activities are destabilising the planet's climate system and are the main culprit of the climate change we are witnessing today[3].

THE REDUCTION IN BIODIVERSITY

Scientists have come to realise that biodiversity (the diversity of animal and plant species in a particular location) is extremely important for the survival of ecosystems. In fact, having a large number of species is one of the elements that ensure the proper balance of an ecosystem. Yet many species are seeing their habitat reduced dramatically as the result of man using natural spaces (for agriculture, building towns, roads, etc.). Added to this are other difficulties, such as hunting, fishing, climate change and pollution, which are making the survival of species increasingly tough. It has been estimated that half of the species known at the present time may be extinct by 2100 if we continue to destroy natural environments.

SUSTAINABLE OR NOT: THE CHOICE IS OURS

We are all able to take action to reduce our impact on the environment. Sustainable development requires a change in our economic system and ways of life if we are to cut back our consumption of natural resources to a level that is viable in the long term for the environment. At the same time, we will need to maintain an economy designed to distribute wealth better on a worldwide scale. In everything we do we need to find the best possible balance between these elements by thinking about the future of every inhabitant on our planet. As part of heading in this direction, many countries, communities and individuals are doing what they can, on their own scale, to try and implement sustainable development.

However, it is hard for us all to know what we can do, each of us on our own scale. Some of the research conducted by experts can help us here: for example, research carried out into the way our ecological footprint is calculated indicates that over half of the human ecological footprint comes from the consumption of energy (travelling, transporting goods, heating, etc.). In second position comes food (farmland, pasture, fishing, etc.). These are areas that we can easily take action on by modifying our choices when we buy products and other items.

Sustainable development can also be encouraged at school: using recycled paper, writing on both sides of sheets of paper, sorting waste, the choice of menus in the canteen, going to school on foot, by bike or bus, etc. There is so much we can do.

But it's all ahead of us. We are at the very beginning of a new era in the way society develops. Together, we can all build a sustainable future. So, let's get to work: the future is in the hands of us all!

3 See the two teaching files and animations dedicated to climate change, available from www.educapoles.org

GLOSSARY:

Biodiversity: The biological diversity of an environment, estimated by the number of animal and plant species that live in it.

Economic growth: The increase in the production of goods and services from one year to the next, or over a given period (e.g. 10 years).

Ecosystem: A group of organisms (plants, animals, micro-organisms) that interact. Human beings are an integral part of ecosystems. All ecosystems together make up the biosphere, the living part of our planet.

Greenhouse gases: Gases that are transparent in visible light and partly gather infrared radiation. Some greenhouse gases occur naturally in the atmosphere (e.g. H_2O, CO_2, CH_4, N_2O) and play a role in the "natural greenhouse effect" that maintains the temperature on the Earth's surface at an average of 15°C (without them, the temperature on Earth would be minus 18°C, like it is on the Moon). Current climate warming originates mainly from the greenhouse gases produced by human activities (CO_2, CH_4, N_2O, O_3, CFC, etc.), which are added to the greenhouse gases that occur naturally in the atmosphere and create an "additional greenhouse effect".

Overexploitation: The excessive use of a resource. Renewable resources are overexploited when they are used beyond their ability to renew themselves.

Ozone: (O3) In the upper atmosphere, the ozone layer is a concentration of ozone that filters out part of the ultraviolet radiation emitted by the Sun. This protective layer is threatened by pollution (e.g. by CFCs, which have now been banned). When it is in the lower atmosphere, ozone acts like a greenhouse gas and is a major air pollutant that is harmful for the health of human beings, animals and plants. This "tropospheric ozone" (or "bad ozone") is produced mainly by the activity of human beings. It is formed by a reaction between elements produced by burning hydrocarbons and oxygen.

RESOURCES:

Read the teaching files dealing with "Climate change (part 1): what is it?" and "Climate change (part 2): consequences in the world and in the polar regions", and watch our numerous animations: "The ecological footprint,a measure that induces to better consuption". "The biodiversity: introduction", "Biodiversity and food", "Resources and reserves: how much energy is left underground?", etc. All of these tools are available from EDUCAPOLES, the education website of the International Polar Foundation (IPF), which also features many teaching and learning activities.
http://www.educapoles.org (NL, FR, EN)

The United Nations (UNESCO) has decided that the years between 2005 and 2014 will be known as "the Decade of Education for Sustainable Development". Visit the website:
http://portal.unesco.org/education/en/ev.php-url_id=27234&url_do=do_topic&url_section=201.html (FR, EN, ESP)

Also explore other websites dedicated to sustainable development, which are full of useful information:
http://www.info-durable.be (FR, NL)
European Strategy for Sustainable Development: http://ec.europa.eu/sustainable/ (FR, EN, DE)
United Nations website: http://www.un.org/esa/dsd/index.shtml (EN)

PRACTICAL SECTION

LEARNING ISSUES

The main issue at stake in this file is dealing with a situation by taking an overall and systemic approach. Working in this way, pupils will come to analyse situations while taking into account the three principal aspects inherent to sustainable development (environment, society, economy), as well as the way they are interdependent, by positioning them geographically and in time. It is also important to refer to the principles of sustainable development (principle of precaution, economy and the good management of resources, individual and collective responsibility, participation, and solidarity in time and space) and to the values associated with them.

ACTIVITIES FOR THIS DOSSIER

1) UNDERSTANDING "SUSTAINABLE DEVELOPMENT IN PICTURES"

Target age group	<12 years	Time required	45 minutes
Aim	To develop a mind capable of observing and analysing, to learn how to identify issues associated with sustainable development		

The teacher will need to have explained about sustainable development before beginning this activity, which can be done alone or in pairs. For each picture, go through the different interpretations the students propose. The teacher can suggest other interpretations if none or only a few are forthcoming. Depending on the level of the pupils, the teacher can also ask them to determine which "circle" from the sustainable development graphic (environment, economy or society) each interpretation belongs in.

Example of interpretation for picture A: This is a plantation because the trees are planted at regular distances apart and are all the same type of tree. The plantation provides work for employees to cut the trees down and carry them away (social aspect). It also generates money for the local businesses in the region (economy). However, the lives of animals are disrupted by this activity and cars pollute the air (environment). Additional questions: Is it a local or international business? (society and economy). Is it a sustainable activity? Would it be possible to conduct the same activity while preserving nature better? How could that be done? (e.g. replanting / planting different types of trees / keeping thickets for the fauna to live in, which would not prevent operations / leave behind the debris from dead trees for the insects / etc.)

Paths to take for the other images (society / economy / environment): picture B) effects on the life of local populations in the Arctic (society) / new marine routes as a result of the sea-ice melting (economy) / disappearance of an ecosystem (environment); picture C) cultural exchanges / technological advances in developing countries / transmission of sustainable technologies; picture D) concentration of population in towns and cities / contrast in earnings / megalopolises, loss of contact with nature; picture E) power and influence of consumers through their choices / interest of the supermarket: lower costs / sustainable products or not (transport, fertilisers, packaging); picture F) deforestation for farming?/ who does the virgin forest belong to? / destruction of a habitat rich in biodiversity (virgin forests) and choice between sustainable or intensive farming

2) "SUPERMARKET SURVEY"

Target age group	12 - 15 years	Time required	90 minutes
Aim	To become aware of the environmental cost of the products on sale in a supermarket and the power of the consumer to favour sustainable products		

This survey is, of course, not fully complete because there are numerous factors that have not been taken into account. However, it does give the pupils a fun way of becoming aware that they can help support sustainable development through their choice of products. If classes cannot go in person to a supermarket, the exercise can still be carried out based on supermarket online purchasing websites.

Here is some additional information that the teacher can provide to flesh out or supplement the survey:
- Methods of transport are one of the main sources of CO_2 (greenhouse gas).
- Fresh products are transported by plane if they come from a long distance. This may require up to 10 times as much oil as coming by ship.
- On average, every European produces 1 kg of waste a day. Packaging represents 50% of this waste and less than one-third of this packaging is recycled.
- Producing an aluminium can or cardboard box requires more energy than manufacturing a spoon. Yet their service life cannot be compared.

3) THINKING GAME: "HUNGER IN THE WORLD, BIODIVERSITY AND OIL: WHAT IS THE RELATIONSHIP?"

Target age group	15 - 18 years	Time required	30 to 45 minutes
Aim	To grasp the complexity of sustainable development, to encourage responsible action		

Working in small groups, ask the students to determine what the relationships are between the 16 cards (cut out in advance). Ask them to create a chart summarising the different relationships (arrows). A few additional clues can also be given: 1) livestock requires large quantities of cereals to be reared, so eating more meat increases demand for cereals; 2) the price of oil has an influence on the price of cereals because of transport, etc. After this, the pupils can then decide for each card which area of the sustainable development graphic it belongs to (economy / environment / society) and also indicate the areas on which it has a direct or indirect influence. Finally, ask the pupils to find at least 3 ways available to them in everyday life to have an effect on the facts shown on the cards.

Sample solution: 7 ->4 ->10 -> 2 ->12 ->9 ->16->1 (also the effect of using cereals for biofuels) ->13 / 14 ->8 ->5 ->13 / 10 -> 15 ->1 / 16 ->13 / 14 ->13 / 14 ->5 / 6 ->13 / 11 ->1 / 14 ->3
Important: emphasise the paradox between 13 and 3

OTHER IDEAS FOR ACTIVITIES

- Ask the pupils to calculate their ecological footprint (individually for the older students, by class for the youngest). Then ask them to decide which factor has the most importance in its impact on their environment (habitat, food, transport, etc.) and what they can do to reduce it.
  http://wwf-footprint.be/fr/ (individual) or http://www.cestlepied.be/ (classes) (FR)
  http://wwf-footprint.be/nl/ (individual) or http://www.voetzoekers.be/ (classes) (NL)
  http://footprint.wwf.org.uk/ (EN)
- Taking news items from the newspaper, identify elements that refer to aspects of the environment, society and the economy. Identify the various parties involved and the roles they play in the situation. Draw a diagram depicting the situation.
- Take a real, current and local issue (floods, drought, violent storms, etc.) and organise discussions about implementing practical measures to remedy the situation.

SUSTAINABLE DEVELOPMENT IN PICTURES

1. Look at each of these pictures.
2. Give each one a heading and describe the situation in a few words.
3. Explain how this situation is linked to sustainable development.

A

B

C

D

E

F

SUPERMARKET SURVEY

THE SURVEY

Divide your team into small groups, with each group responsible for one of the following product ranges:

1. Fruit and vegetables
2. Meat
3. Dairy products
4. Pasta and cereals (rice, wheat meal, polenta, etc.)
5. Maintenance and cleaning products
6. Beauty products

Each of the teams heads for its allotted department to find the following information for at least 10 different products (different brands of pasta or rice count as different products):

- The product name (e.g. courgette, shampoo, spaghetti, etc.)
- The product brand
- Description of the product packaging (e.g. 1 pack in plastic and cardboard (for spaghetti), numerous plastic packs (for biscuits packed in small portions for tea breaks), 1 cardboard pack with aluminium liner inside (for milk cartons), etc.)
- Location or country where the product was produced or made
- Number of different elements involved in manufacture (especially for cleaning and beauty products)

Back in the classroom, calculate for each product the distance between its place of origin or manufacture and the supermarket (in kilometres).

THE TOP 10 AND BOTTOM 10

Gather all of your team's information and rank the 60 products from the best to the least good in terms of the environmental impact. To do that, use the following criteria:

1. Most important criterion: Distance transported (in kilometres).
2. Second-most important criterion: Quantity of packaging (manufacturing a pack and disposing of it requires energy).

If two products are more or less equal, distinguish between them by counting the number of elements that go into producing them. Each of these elements has had to be transported to the place of manufacture. This can conceal additional expenditure in energy.

Now create your list of the 10 products that are most economical in energy, and the 10 least economical. Then compare your list with the other teams.

HUNGER IN THE WORLD, BIODIVERSITY AND OIL: WHAT IS THE RELATIONSHIP?

1 World prices for corn and cereals almost doubled between 2005 and 2007, and the trend continued in 2008.	2 Using oil and other sources of fossil fuels (gas, coal), produces greenhouse gases.	3 Agricultural production exceeds the needs of the world's population. More than one billion people on Earth suffer from over-eating.	4 Transporting fruit and vegetables grown on the other side of the world to the supermarket consumes a great deal of oil.
5 Many species are endangered by climate change, because of pollution or because their natural habitat has disappeared. Half of the species known at the present time could disappear by 2100 if the destruction of natural habitats continues.	6 In developing countries, vegetables and cereals produced by intensive farming methods in industrialised countries are sold at very low prices, sometimes even lower than the same vegetables or cereals produced locally by small farmers – which sometimes poses a problem of survival for these farmers.	7 The vegetables and cereals produced by the industrialised countries (intensive farming, mechanised tools) are exported all over the world. Conversely, some developing countries grow products for export to industrialised countries (exotic fruit, coffee, etc.).	8 The fertilisers used for agriculture are only partly absorbed by plants. A large proportion is washed away by the rain and is carried into rivers and oceans, where some elements cause significant pollution.
9 One of the consequences of the current climate change is the increase in extreme climate-related events (drought, floods, etc.)	10 Consumption of oil continues to rise. Oil is used mainly for transport.	11 The emerging economies (e.g. China) have increased their consumption of food, especially meat, very quickly.	12 The greenhouse gases produced by human activities are the main culprits of current climate change.
13 Of the 6.7 billion inhabitant of Earth, 856 million suffer from hunger. The majority of these live in the country and are fed by the resources of nature alone (smallholdings, gathering food, fishing, etc.).	14 More of the world's land has been converted to farming since 1945 than in the 18th and 19th centuries combined. Prior to that, this land was home to many species of animals and plants (e.g. in virgin forest).	15 In 1970, a barrel of crude oil cost less than 10 dollars. In general terms, the price of oil is rising and will continue to rise because if we continue to consume as much oil as we do today, there will probably be none left in 40 years' time.	16 In 2008 and 2009, harvests were poor in a number of major producing countries on account of numerous extreme climate-related events (drought, floods, etc.)