UnderCover

RESOURCE BOOK ON GLOBAL DIMENSIONS
OF OUR CONSUMPTION FOR TEACHERS

NAZEMI

... STUDENTS TO EXPLORE NEW CONNECTIONS

EXPENSIVE PURCHASE

Goals:	Students become aware of the relationships between goods in the department stores, their origins and the consequences of their shopping habits. Students reflect on how the price of a product is structured, they infer what externalities are and they find a real-world example. Students develop their abstract thinking with the help of formal logic.
Curriculum links:	Mathematics, Biology, Economics
Age:	14+
Time:	45 minutes
Materials:	2 × set of cards with commodities that have a highlighted market price (H) *(Attachment 1)* 2 × set of cards with highlighted environmental costs (E) *(Attachment 2)* 2 × set of cards with highlighted social costs (S) *(Attachment 3)* 6 × (12 ×) shopping list *(Attachment 4)* overview of prices *(Attachment 5)*
Preparation:	This simulation game helps the students to understand the concept of externalities. As a preparation, do not forget to read the infobox.

Procedure

GAME / 20 min.

- At the beginning of the lesson, students in groups will solve a logical task connected to shopping which is described in the Attachment 4. Tell them that they will get the shopping list of a family in which every member has special requirements and needs so the students need to choose which products *(Attachment 1–3)* they should buy to make everybody happy.The first three attachments contain pictures of some products. The differences between them are only in the prices. At this moment this fact is not important for the students. Do not give them any explanation yet.
- Divide students into six groups. Each group gets *Attachment 4* and a set of cards (2 groups will get a set from the *Attachment 1,* 2 groups a set from the *Attachment 2*, 2 groups a set from the *Attachment 3*). Set a time limit of 10 minutes.
- After the time limit, tell each group to calculate the price of their list of chosen products. Subsequently, the groups present their solutions. That group from each pair which has achieved a lower price shall first present their solution. The group will demonstrate (write on the board) what they have bought and for whom. The other groups have one minute to check whether the assigned conditions have been met.
- Compare tha solution with the *Shopping Key*. Be aware that there will be three different results according to the number of the set of cards. If the first of the two groups fails to meet the conditions, the second group presents their solution and the scenario repeats. If none of the groups succeeds, give them the time to re-do the activity and to correct the presented solution on the board and calculate the new sum which will be visible for comparison. (See the Shopping Key)
- Repeat the activity for all three pairs of groups. The three different final sums for cheaper shopping serve as a good connecting link to the following discussion.

REFLEXION / 25 min.

Discussion

- The activity is followed by a discussion instigated by the following question: "*Which shopping was the cheapest?*" The groups will probably be basing their deliberation on the price at the bottom-right corner. If some group does not follow this logic, it is a good starting point for debate.

- *What would you most probably choose from the offer? Why?* (The reasons can be eg. the price and the difference between some of the products)
- *What can influence a price?*
- *Why do we have three different results?*
- *What does each price mean?*

  Here is the space for the teacher to explain the concept of externalities. You can start with the question: *Have you ever heard the term „externality"?*

- Ask the students for specific examples: *Which real-life example of an externality do you know?* You can use the examples from ***Infobox***.
  - *According to which price should I make my shopping decisions?*
  - *Can other prices become incorporated into the market price? Would it be correct?*
  - *Who should bear the costs of externalities? Etc.*

  Together search for examples that strive to include externalities in the price.

Shopping key

	MARKET (Att. 1)	**SOCIAL** (Att. 2)	**ENVIRONMENTAL** (Att. 3)
Mam	water, walk and ice-cream	water, walk and ice-cream	water, walk and ice-cream
Dad	walk and kofola	walk, organic sweet cider	walk, organic sweet cider
Lucie	walk and cinema	walk and cinema	walk and cinema
Petr	PC game and football	PC game and T-shirt	PC game and T-shirt
Bára	walk and cinema	walk and cinema	walk and cinema
Jakub	apple, banana, light sword	FT chocolate, japple and juice	FT chocolate, japple and juice
	Price: 133	**Price: 76**	**Price: 115**

Infobox

Externality

An externality is defined as an external impact of some activity.

In economic theory, the term is used for "either a positive result of economic activity which benefits somebody other than the person(s) performing that economic activity (positive externality), or a negative effect of economic activity which is not paid for by the person(s) performing that economic activity (negative externality). The activity therefore causes unintended benefits or costs to others without them being paid for."[1]

A typical example of a negative externality is the pollution of the environment. E.g. a power plant that burns coal and produces electricity. Burning coal gives rise to emissions that damage the forests around the plant. Some parts of the forests die.

If the power plant is not made to cover these damages, it does not bear all the costs for the production of electricity – the costs expended on the regeneration of the damaged forests are born by their owners. The power plant therefore transfers part of its costs for generating electricity to others.

Examples

In this activity we can for example look at goods wrapped in covers containing large amounts of aluminium (soda pop in a can, chocolate, chocolate eggs). The ore used for the production of aluminium is bauxite. The production of pure aluminium is a rather complicated and especially energy-intensive process (the world's average is around 15 kWh per 1 kg of aluminium). Where does the production process take place? And where do the externalities originate?

Australia extracts 33% of the world's bauxite. In 2009, China became the second largest producer (15%). It is followed by Brazil (13%), Indonesia (8%), Guinea (7%) and India (7%). The future of bauxite extraction lies however rather in reserves that are located chiefly in the tropical and subtropical regions. These are estimated to be: Guinea – 7.4 mil. tons, Australia – 5.8 mil. tons, Jamaica – 2.0 mil. tons.

The energy-intensive aluminium production nonetheless occurs elsewhere. Almost one third (31%) of the world's aluminium is produced by China (where 66% of power consumption in fact derives from coal)[2], Australia produces 26% and Brazil 11% (all of these data were taken from the 2009 statistics).[3]

Negative externalities during the manufacture of a beverage in a can are, for example, strip mines for bauxite degrading the landscape, CO_2 emissions originating during the transport of large quantities of the ore to the processing plants, and chiefly other emissions from the power plants generating electricity required for the smelting of aluminium from bauxite.

Pollution of the environment is not the only effect which is unintended (or rather not included or considered in the price). The activities in question often affect the inhabitants of these regions in some way. These impacts may be direct (bad working conditions, child labour, slavery) or indirect (disruption of the environment that will affect the lives of the local population later on – e.g. deforestation to create new farmland, etc.).

In the cultivation of bananas or cotton, high amounts of chemicals – pesticides or preservatives – are used. This causes health problems for many of the workers at the plantations. One of the consequences is sterility in men or an increase in the number of miscarriages among women.

The bottling plants of Coca-Cola and Pepsi in the dry regions of India use huge amounts of underground water and their consumption has disrupted the cycle of this vital liquid. The farmers living adjacent to these plants have lost their livelihood.

These additional costs can be seen e.g. in the high "social price" of Coca-Cola, the light sabre, the Kinder Surprise egg or the bananas. These are typically products from the global South whose manufacture has tangible impacts on the life of the local people.

Tools for solution

Is there a way to make the market price of an item reflect negative externalities? Such efforts undoubtedly exist, yet none of them provides a one-size-fits-all solution.

1. A ban on an activity that produces a negative externality (e.g. the ban on using freons, which destroy the ozone layer).
2. Setting a maximum limit for the negative externality (each entity is given a maximum limit in individual spheres – e.g. emission allowances: each state of the EU has a defined maximum limit for the production of greenhouse gases and it is possible to buy and well them freely).
3. Regulation of the norms of behaviour – obligation to have a sewage water treatment plant, catalytic converter; declaration of a protected area, etc.
4. One-time financial aid (e.g. state support for insulation of houses and flats, higher subsidies to organic farming, etc.)

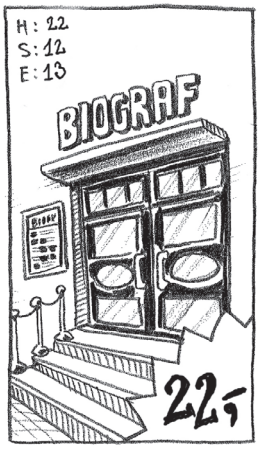
The realm of regulated norms of behaviour could also include various certification systems (e.g. BIO, Fairtrade, FSC). These certifications assure the exclusion of some negative phenomena but they do not involve the stipulation of a new norm of behaviour by some authority (state, international organization, etc.). The means for their enforcement lie with the consumer who requires such guarantees to be put in place.

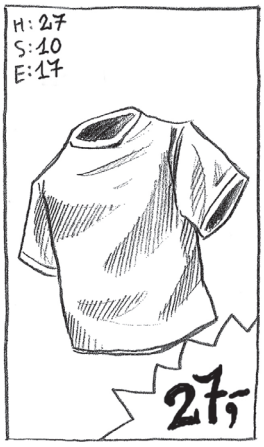
The efficiency of such regulatory means is not very high, yet it currently presents the only alternative to a situation where no social consensus exists regarding legislative regulation of these phenomena.

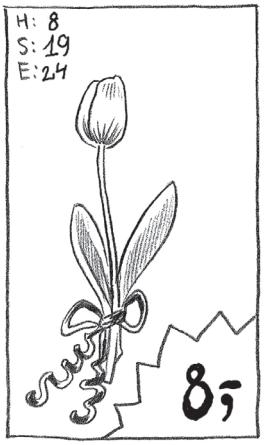
[1] business.center.cz;
[2] the date from the year 2005, World Resource Institute [online]http://www.wri.org/project/earthtrends;
[3] World Mineral Production 2005-2009, British Geological Survey [online] www.bgs.ac.uk

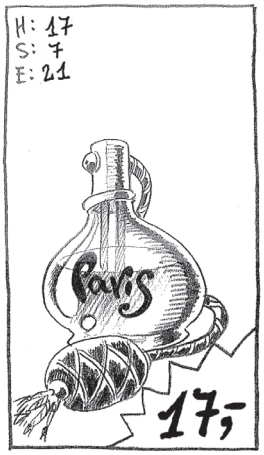
Attachment 1

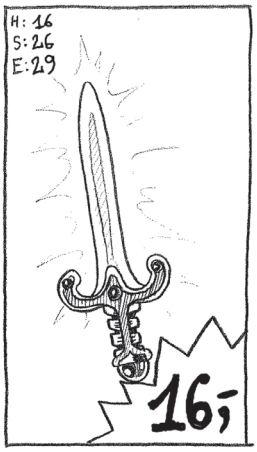
Attachment 1

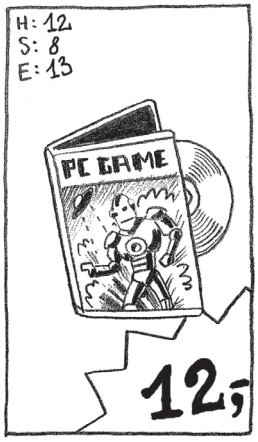






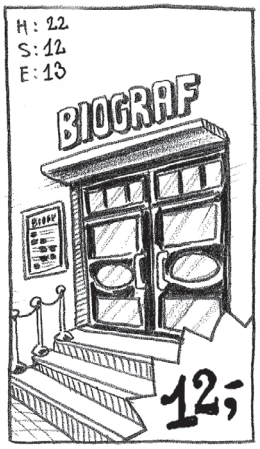


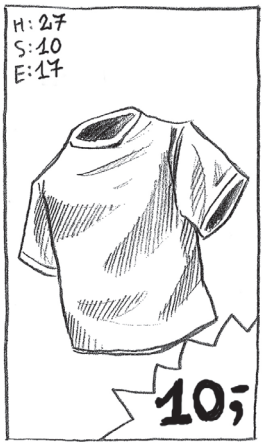


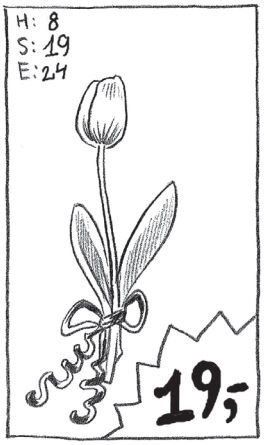


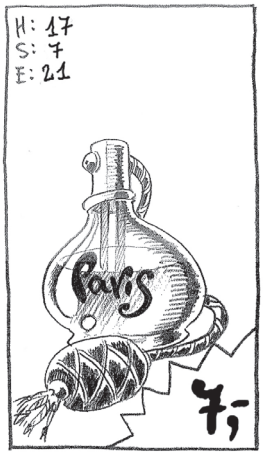
Attachment 2

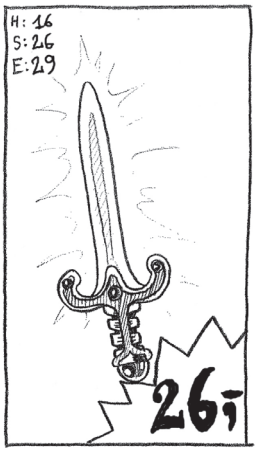
Attachment 2

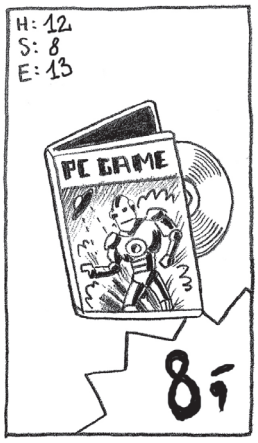






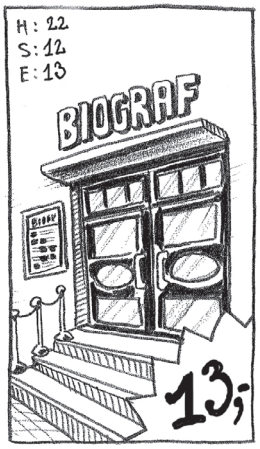


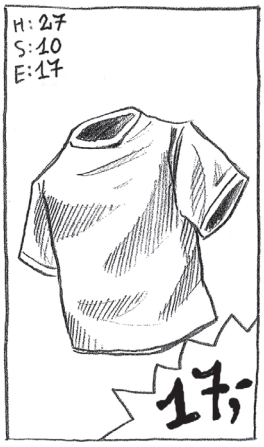


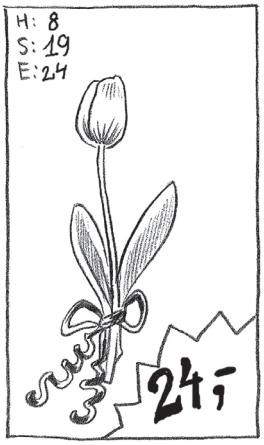


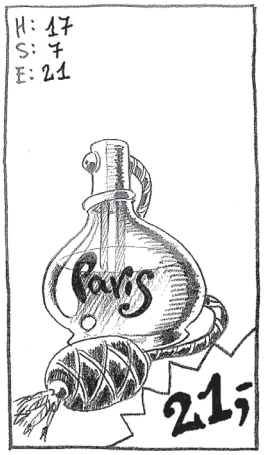
Atatchment 3

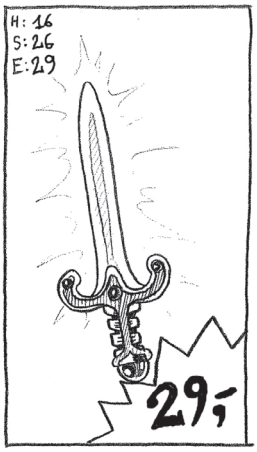
Attachment 3

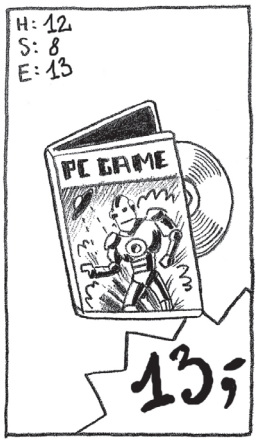












Shopping list

family: mum, dad, Petr, Lucie, Bára, little Jakub

- Each family member gets at least two products.
- The family does not buy any of the products more than once.
- This does not apply to the cinema, aqua park or a walk, because nobody may do these things alone.
- Nobody gets two drinks or two kinds of food, except for Jakub.*
- Lucie goes either to the aqua park or to the cinema.
- Mum either does not buy anything to drink or she goes for a walk.
- If Bára does not get crisps or ice-cream, Petr gets a PC game.
- Dad buys either juice, organic sweet cider or kofola lemonade.
- Jakub gets a juice and chocolate or a light sabre.
- Petr gets a T-shirt, or Coca-Cola and dried meat, or a football.
- If Lucie does not get a Kinder Surprise egg, mum buys an ice-cream.

*By food we mean everything that is edible.

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Attachment 5

Overview of prices

COMMODITY	MARKET PRICE (H)	PRICE INCLUDING THE SOCIAL COSTS (S)	PRICE INCLUDING THE ENVIRONMENTAL COSTS (E)
Water	0	3	3
Cheap lemonade	7	5	15
Soda pop in a can	22	12	26
Organic juice	30	4	3
Coca-Cola	29	29	19
Juice	25	7	22
Coffee in a café	20	17	12
Kofola lemonade	15	8	11
Apple	5	5	3
Chocolate	10	20	19
Banana	7	22	25
Fairtrade chocolate	24	3	7
Ice-cream	12	8	17
Kinder Surprise egg	23	27	26
Dried meat	29	25	25
Crisps	13	16	18
Going for a walk	0	1	1
A film at the cinema	22	12	13
T-shirt	27	10	17
Tulip	8	19	24
Perfume	17	7	21
Light sabre	16	26	29
Football	21	23	20
Computer game	12	8	13
Aqua park	28	14	27

Note: The value of the individual products (in all types of prices) is based on the author's experience. It merely reflects the estimated probability of the occurrence of negative phenomena in the individual product type. The data are therefore only informational.

FRAGILE TRAVELLERS

Goals:	Students identify what flowers symbolize and express in social life and realise how often they come across them in their daily life. Students identify the consequences of flower business. Students express their attitude towards the issues connected to the flower business and suggest personal alternatives.
Curriculum links:	Biology, Geography, Social Studies
Age:	14+
Time:	45 minutes
Materials:	printed questionnaire for each student *(Attachment 1)* 4 photographs *(Attachment 2)* one slip of paper with information about flower production for each student *(Attachment 3)* one handout for each student *(Attachment 4)*
Note:	In some of the following lessons, students can watch the film *The Blooming Business*, which shows the situation at flower farms in Kenya. You can find the film on the enclosed DVD.

Procedure

EVOCATION / 10 min.

- Tell students that the topic of the lesson today will be flowers and that their first task now will be to do a quick „class survey" on this topic.
- Explain the task first: everybody will get a simple questionnaire with four questions and your task will be to get up, walk around the class and get answers to those four questions from at least three different people. Tell students that they will have 5 minutes to do the survey. When everybody knows what to do, distribute the questionnaires *(Attachment 1)*. This activity should be quite dynamic. You can support the atmosphere by playing music – when you stop the music, it is a signal for students to stop going around and asking questions.
- Go through the questions with the class and ask students what they learned: *Have you found anything interesting? Has anything surprised you? Have you got any answers that were repeated more than once?* After that, pay attention to the last question: *Where do flowers come from?* and ask students to come up with their ideas. (If they say that flowers come e.g. from a garden, ask them whether this is the only place where we get flowers from. If they say that flowers come from a shop, ask them: *How do they get to the shop? Where are they from?* However, don't tell them any details about flower production yet.)
- Tell students, that in the following activity they will have a chance to learn more about the production of flowers.

REALIZATION OF MEANING / 20 min.

- Prepare four different photos *(Attachment 2)* showing the different stages of flower production.
- Put the photos somewhere around the classroom and divide students into pairs or small groups. Their task will be to walk around, have a look at each photo and answer three questions. Write them on the board and tell students that they will have 30 seconds for each picture. For bigger groups prepare two copies of each picture so students have more space for discussion.
  1) *What do you see in the picture?*
  2) *Where was the photo taken?*
  3) *Is there anything interesting or surprising? What? Why?*
- Back with the whole group, go through the questions and ask students to share their ideas, but don't tell them more information about the photos yet.
- Tell students that each of them will get a slip of paper with a piece of information about the flower production chain *(Attachment 3)* and that their task will be to choose one of the photos – the one they think the infor-

REALIZATION OF MEANING / 20 min.

mation relates to the most. They should also be able to explain what they think the connection is. After that, distribute the slips of paper. Students can walk around and have a closer look at the photos again. Give them 3-4 minutes to decide and choose one of the photos so they form four groups (it is OK if the groups do not have equal numbers). If there are more than 15 students in your class, give each slip of paper to a pair of students.

- In groups, students share the information they learned from the slips of paper and tell the group why they chose this photo (assure them that there are no wrong reasons for their decision about the photo as long as they have "their" argument). Tell them that each group should now decide what the most important thing they have learned is and create a „sculpture" out of their bodies in which they express it. Every member of the group should be a part of the sculpture. Give them 3–5 minutes for preparation.
- The groups present their sculptures – the rest of the classroom tries to guess what they were trying to express (you can ask: *What is the most important thing about flower production the group has learned?*). The authors of sculptures can then inform the class what their sculpture was supposed to represent and add more details.
- After all sculptures are presented, give every student a handout ***(Attachment 4)*** with details about the flower business (it is the same information that they got on the slips of paper). Give students 3 minutes to read through it.
- At this point, return to the photos from Worksheet 2 that represent the stages of flower production and ask the question *"Where were the photos taken?"* again. Let students express their ideas. After that, tell them about the origin of the photographs (see ***Attachment 2***).

REFLECTION / 10 min.

- In the final part of the lesson, students should reflect on how they feel about flowers, what they learned about the production of flowers and its consequences and think about the possible alternatives. Tell them that on the other side of ***Attachment 4*** they have five questions which they should answer individually. Give them five minutes to answer in writing.
- To conclude the lesson, ask students to share their answers to the last question on the worksheet: *You are going to a birthday party and you are expected to bring a small present, such as flowers. The thing is, you do not have enough time. What will you do?* If the students tend to answer that they are not going to buy any flowers, but something else, ask directly: *What possibilities do we have if we want to give someone a flower?*
- At the end of the lesson, you can also mention the alternative of certified flowers (see ***Infobox***). Not all alternatives are answers to all problems mentioned above. Ask the students: Which alternative is a solution to which problem?

Recommendations

If you have more time or you work with older students, as a follow up you can create a so called "issue tree". This method helps them to understand the issue in its broader complexity. A trunk of the tree drawn on the poster represents the problem "flowers are being imported from far away countries." The students should write at least five of the problem causes in the area of the roots, at least five consequences where the branches are. The consequences can be either positive or negative. The fruits of the tree are at least four solutions which the students are to suggest. These solutions can tackle different levels of the problem.

Infobox

Certified flowers

There are initiatives around the world that are trying to raise awareness about the negative effects of flower production in the global South. Their aim is to change our consumption and shopping patterns towards ensuring that flowers are produced in socially and environmentally friendly conditions.

One alternative to conventional flower production – one that ensures better working conditions for the workers on the flower farms and reduces environmental pollution caused by the flower farming – is certified flowers. One example of such production is the flower farm in Oserien in Kenya, which produces certified fair trade flowers (*Attachment 2*, photo 3.).

For more information go to:

www.fairflowersfairplants.com
www.flowers-for-human-dignity.org
www.transfairusa.org/content/flowers
www.fairtrade.org.uk/producers/flowers/finlay_flowers_oserian_ravine_roses_kenya.aspx

Attachment 1

	Person 1	Person 2	Person 3
What occasions do you associate flowers with?			
Why do you think people give or get flowers?			
When did you last give or get flowers?			
Where do the flowers come from?			

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When did you last give or get flowers?			
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	Person 1	Person 2	Person 3
What occasions do you associate flowers with?			
Why do you think people give or get flowers?			
When did you last give or get flowers?			
Where do the flowers come from?			

	Person 1	Person 2	Person 3
What occasions do you associate flowers with?			
Why do you think people give or get flowers?			
When did you last give or get flowers?			
Where do the flowers come from?			

Attachment 2 – preview

source: Wikimedia Commons

Flower auction in Aalsmeer, The Netherlands – the largest flower auction in the world

source: Ekumenická akademie

Flower farm in Uganda

photo: Petr Foltýn

Flower shop in Brno, Czech Republic

photo: Eva Malířová

Fair trade flower farm Oserien, Kenya

Attachment 3

Roughly a third of all the roses sold annually in the Czech Republic are sold – at twice the normal price – on St. Valentine's Day.

Only one out of every 50 roses sold in the Czech Republic comes from a domestic supplier now.

The vast majority of flowers are imported from traditional Dutch flower auctions. In the past, they were grown in the Netherlands, too.

Today, flowers traded at Dutch auctions have been airlifted there from Africa, Asia or Latin America, where the climate is more favorable for year-round growing.

A flower's journey from a field in Kenya, Ethiopia or Uganda to a flowershop in Liberec takes no more than five days.

Every third rose sold in Europe on St. Valentines day comes from Kenya.

During the last 20 years, Africa has become an important producer of roses, gerberas , chrysanthemums, carnations and other flowers sold mostly in Europe.

Almost one third of the world's flower production comes from Kenya, which exports to Europe 85 thousand tons of flowers a year, and agriculture is the second largest contributor to Kenya's gross domestic product (GDP) after the service sector.

To produce 1 hectare of roses 10 to 30 thousand litres of water is needed every year.

Flowers are treated with various types of dangerous chemicals called pesticides, which threaten the health of the workers on the farms and pollute the water resources near the farms.

If we buy roses or chrysanthemums in a flower shop, probably 9 out of 10 flowers will come from Africa and those flowers have travelled more than some of us in our lifetime.

Some of the flowers, depending on the climate conditions, are refrigerated just after cutting. Then they are transported to the airports and airlifted to flower markets in Europe.

Every growing rose needs 1.5 litres of water a day. Alarmingly, flower farms are often placed in areas that suffer water scarcity.

In Kenya, around 300 000 people work in the flower production business. However, in most cases, those new job opportunities bring bad working conditions and salaries that often do not cover living costs.

The best-selling flowers at the biggest Dutch flower auction in Aalsmeer are roses, followed by chrysanthemums, tulips, lilies and gerberas. Every year, the auction sells 12 billion cut flowers.

Chemicals (various types of pesticides) used on the flower farms are very dangerous for the workers, who are often not provided with proper protection. The symptoms related to pesticide exposure include e.g. excessive tiredness, nausea/vomiting, headache, dizziness, skin and eye irritation.

Attachment 4

Flower business

- Roughly a third of all the roses sold annually in the Czech Republic are sold – at twice the normal price – on St. Valentine's Day. Every third rose sold in Europe on St. Valentines day comes from Kenya.
- A flower's journey from a field in Kenya, Ethiopia or Uganda to a flowershop in Liberec takes no more than five days.
- Only one out of every 50 roses sold in the Czech Republic comes from a domestic supplier now.
- If we buy roses or chrysanthemums in a flower shop, probably 9 out of 10 flowers will come from Africa and those flowers have travelled more than some of us in our lifetime.
- The vast majority of flowers are imported from traditional Dutch flower auctions. In the past, they were grown in the Netherlands, too. Today, flowers traded at Dutch auctions have been airlifted there from Africa, Asia or Latin America, where the climate is more favorable for year-round growing.
- The best-selling flowers at the biggest Dutch flower auction in Aalsmeer are roses, followed by chrysanthemums, tulips, lilies and gerberas. Every year, the auction sells 12 billion cut flowers.
- During the last 20 years, Africa has become an important flower producer of roses, gerberas , chrysanthemums, carnations and other flowers sold mostly in Europe.
- Almost one third of the world flower production comes from Kenya, which exports to Europe 85 thousand tons of flowers a year and agriculture is the second largest contributor to Kenya's gross domestic product (GDP), after the service sector.
- To produce 1 hectare of roses, 10 to 30 thousand litres of water is needed every year.
- Flowers are treated with various types of dangerous chemicals called pesticides, which threaten the health of the workers on the farms and pollute the water resources near the farms.
- Every rose needs 1.5 litres of water a day. Alarmingly, flower farms are often placed in areas that suffer water scarcity.
- In Kenya, around 300 000 people work in the flower production business. However, in most cases, those new job opportunities bring bad working conditions and salaries that often do not cover living costs.
- Chemicals (various types of pesticides) used on the flower farms are very dangerous for the workers, who are often not provided with proper protection. The symptoms related to pesticide exposure include e.g. excessive tiredness, nausea/vomiting, headache, dizziness, skin and eye irritation.
- Some of the flowers, depending on the climate conditions, are refrigerated just after cutting. Then they are transported to the airports and airlifted to flower markets in Europe.

Sources:

Lindner, Tomáš (2010): Růže pro tebe. *Respekt*, 6/2010.
Uganda Workers' Education Association:
Action Research Report on Impacts of Pesticides on Horticultural Workers in Ugandan Horticultural Farms. 2011.
www.flowers-for-human-dignity.org/09/index.php/the-campaign.html
www.ekumakad.cz/cz/projekty/fair-flowers
www.flora.nl/en/AboutFloraHolland/Cooperative/Documents/KengetallenEN2009.pdf

Attachment 5

Answer the following questions:

What comes into your mind when you think of flowers now?

Is there anything that surprised you? If so, what?

What do you think the main problems with the flower business are?

You are going to a birthday party and you are expected to bring a small present, such as flowers. The thing is, you do not have enough time. What will you do?

CHOCOSTORY

Goals:	Students will be introduced to the history & travels of chocolate around the world. Students understand some aspects of the social, economic and environmental impact of chocolate production and consumption. Students perceive themselves as a part of the economic chain and understand their ethical role as consumers.
Curriculum links:	Social Sciences, History, Biology
Age:	12–14
Time:	45 minutes
Materials:	the Choco-Cards (photocopy 3 sets of cards) *(Attachment 1)* the Help Card (photocopy it 3 times) *(Attachment 2)*

Procedure

EVOCATION / 5 min.

- Have your students answer the following questions in pairs or together as a class.
  - *Do you like chocolate?*
  - *In what form do you prefer it?*
  - *How often do you eat it?*
  - *Is chocolate made in Greece? Where does the cocoa come from?*
  - *Do you think that people have always eaten chocolate? Do you know when they first did?*

BUILDING KNOWLEDGE / 20 min.

- Divide the students in three groups. Give each of them a set of cards and a help card. Their task is to decide in group what each card represents/tells us and then make a storyline of the cards regarding the production and history of the chocolate. If the students have trouble with forming the storyline they may refer to the Help Card.
- Walk around the groups in case anyone has questions but do not interfere; let the students give their own meaning to the cards, using their imagination as well as their knowledge.
- Tell the students that they will have to find the most imaginative way to present their story, with the participation of all members of the group. They can tell a story, dance to it, play it out, present an alternating tableaux vivant etc. Each group will have 2 minutes for the presentation.
- Next, ask each group to present their stories to the rest of the class. When they finish, ask them some questions about the most difficult parts of the story.
  When all three groups have presented their stories, clear up any misunderstandings about the production chain and the production storyline. Discuss with them the colonization of South America and Africa, international trade then and now, slavery and present day working conditions, overconsumption.

REFLECTION / 20 min.

- This can be followed by a group activity where students will actively present their opinion. Tell students to stand up and imagine a line in the middle of the classroom and put an "Agree" and a "Disagree" sign on opposite sides. The students should choose sides and argue according to their answer to the following questions:
  - *I always check the ingredients of chocolate and its origin*
  - *Children who pick cacao beans (in the developing countries) can eat chocolate every day*
  - *Chocolate is not healthy*
  - *It doesn't matter where the chocolate comes from*
  - *Children should not work*
  - *Present day working conditions in the chocolate production chain are fair*

- Invite the students in a circle and discuss the following questions: "*Which human rights do you think are violated in the chocolate production chain?*" and "*What is your role in the chocostory?*" Take a few minutes to discuss that -in groups or individually.

Recommendations

- If you want to explore the matter further you can ask the students to research the issue of child labour, find out the major industries that use it, which consumer products they produce, in which countries it is illegal, what the status in your country and in the EU is, how a consumer can react.
  Also if you want to introduce to the class the notion of active citizenship you can have them research the various Greek or foreign chocolate companies, find out where they buy their cocoa from and if they disagree with the company's policy, write a letter to the company asking them to reconsider their policy as well as boycotting their products.

Infobox

Did you know that…?

Did you know that cocoa beans were used in many parts of the pre-Columbian Central America as currency? The ethical advantage was that they could not be stored forever and hence prevented long-term wealth accumulation. As the people on the territory of today's Maxico said: "Oh fortunate gold, it […] protects his innocent owners from the hellish curse of greed, for it can be neither buried nor kept long."

Did you know that in the 19th century, cultivation of cocoa was brought to the Gulf of Guinea in Africa, where slavery-like practices went on?

Did you know that cocoa trees do not produce high yields – each tree produces only 30–50 fruits per year? The annual yield of a cocoa tree covers the production of approximately three larger chocolate bars.

Did you know that after about 20 years of planting the cocoa trees, yields start to decrease? The soil is exhausted and susceptible to erosion and old trees loose resistance to pests and disease. Cocoa farmers then have to decide whether to invest in renewing the plantation or whether to move to another place and plant new cocoa trees. For small farmers, the first option is often unaffordable and cocoa cultivation thus further expands at the expense of primary forests.

Did you know that cocoa is usually processed in developed countries, which are thus reaping the most benefits from the cocoa trade? High customs duties imposed on processed cocoa are one of the reasons.

Did you know that 50 million children under 11years of age work in conditions that directly harm their health?

Did you know that 70% of child labourers are involved in the agricultural sector? Children also work in the manufacturing industry, trade, transportation, in hotels and restaurants or in the streets. Many are involved in illicit activities.

Did you know that approximately one out of every seven children is currently involved in child labour? The term "child labour" refers to "work carried out by children aged 14 years or less that is mentally, physically, socially or morally dangerous and harmful to children's well-being and development and that interferes with their schooling, regardless of whether children receive wage or not"

Did you know that more than two thirds of cocoa beans come from West Africa? 1,8 million children are forced to work on West African cocoa plantations.

Did you know that determined criteria must be met in order to gain the Fair-Trade label also include the prohibition of forced and child labour, the ban of hazardous agrochemicals and the prohibition of using genetically modified organisms?

Did you know that large trans-national corporations, in particular their effort to lower production costs as much as possible, also have a considerable impact on the problem of child labour?

Did you know that to a large extent, the lack of education is the cause of child labour? The better the education, the higher the chance for decent working conditions and reasonable wages as well as self-confidence, awareness of human rights and health.

Did you know that the increase in production of cocoa beans was 4.4 million in 2011, approximately 100 thousand square kilometres of land? It is estimated that most cocoa is produced by 5–6 million small-scale farmers.

Sources:

UNITED NATIONS – *Child Labour* (2012). Available on: http://www.un.org/cyberschoolbus/briefing/labour/labour.pdf

International Labour Organization (2012). Available on: www.ilo.org

Child Labour-Payson.org (2011). *Oversight of Public and Private Initiatives to Eliminate the Worst Forms of Child Labour in the Cocoa Sector in Cote d´Ivoire and Ghana*. Available on: www.childlabor-payson.org

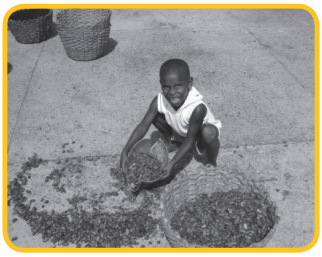
Export Solutions (2012). Available on: http://www.exportsolutions.com/ExportTipsDetails.aspx?id=74&title=-Fun%20Facts-%20Per%20Capita%20Chocolate%20Consumption,%20by%20country

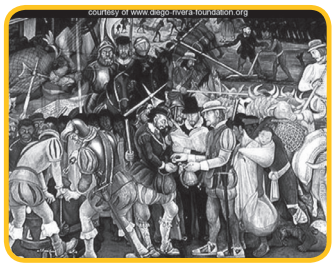
Fairtrade.net (2010). *Tackling Child Labour in the Chocolate Industry – What Role Can Fairtrade Play?* Available on: http://www.fairtrade.net/single_view1.html?&cHash=3e23e04ba4&tx_ttnews%5Btt_news%5D=129

FAIRTRADE.ORG.UK (2011). *Fairtrade and Cocoa*. Available on: http://www.fairtrade.org.uk/includes/documents/cm_docs/2011/C/Cocoa%20Briefing%20FINAL%208Sept11.pdf

Faostat (2011). *Food and Agriculture Organization Corporate Statistical Database*. Available on http://faostat.fao.org/

Attachment 1 – preview







Attachment 2

Cocoa trees were sacred for the pre-Colombian civilizations.
The Mayas used to drink their chocolate with vanilla and chili!
The Spanish conquistador Hernán Cortés contributed to the fall of the Aztec civilization.
Sugarcane plantations in Central America provided cheap sugar to the rest of the world.
The cultivation of cocoa trees started in Central and Latin America but was soon transferred to West Africa. Countries like Ivory Coast are completely dependent on the exportation of cocoa beans.
A cocoa tree plantation lives for approximately 20 years whilst the yearly production of fruit is enough for only 3 chocolate bars.
Virgin forests are being cut so that the land can be used for cocoa plantations.
Every year more than 200 million children every year become victims of illegal child labor. In the cocoa plantations of West Africa alone it is estimated that there are 200.000 child laborers.
Chocolate is produced in the countries of the so called developed world because of lack of skills in the countries that produce cocoa and because of the taxes that burden trade in treated cocoa beans.
Among the countries with the biggest chocolate consumption are European countries, especially in Western Europe, like Switzerland, Great Britain, Belgium and Germany.

PLASTIC SEA

THIS ACTIVITY WAS INSPIRED BY PARTICIPATE, A HANDBOOK BY THE ORGANIZATION RISC.

Goals:	Students search for information dealing with plastic waste all around the world. Students propose possible solutions to the problem of plastic waste in the sea and try to suggest what they can do about the problem. Students compare the efficiency of the proposed solutions for reducing plastic waste.
Curriculum links:	Geography, Biology
Age:	14+
Time:	45 minutes
Materials:	sheets of paper to write on and to stick the Diamond on writing utensils for each pair ca. 10 plastic bags (PET bottles are optional) „Plastic Quiz" questions printed on cardstock *(Attachment 1)* Photos of floating waste *(Attachment 2)* computer projector internet connection to play the animated video a set of cards for the Diamond *(Attachment 3)*, varying according to the number of groups
Preparation:	Before class, print out the "Plastic Quiz" questions *(Attachment 1)* on cardstock and cut them up. Put each question into a small separate plastic bag or a PET bottle and then put them all into a large plastic bag. While sending and unpacking the questions, students get a feel for the material the class will focus on. Find the video animation of ocean currents in the Pacific Ocean. Print out sets of cards with correct answers *(Attachment 3)* on coloured sheets of paper and cut them up.

Procedure

EVOCATION / 5 min.

- Tell the students that today's class will be focused on travelling. Ask them: *Do you like travelling?*

- The students work in pairs. Each pair needs writing utensils and a sheet of paper. The goal of each pair is to come up with as many things that travel around the world as possible. Then let the students read their ideas aloud. A list of the ideas may be written on the board. If rubbish is not on the list, ask:
  Do you think that rubbish could travel around the world? If so, where from, where to and why?

REALIZATION OF MEANINGS / 20 min.

- Split the students into eight pairs or small groups (according to the number of plastic bags with questions). Each pair needs a sheet of paper and a pencil to record their answers. The students will be assigned the following task:
  Now we are getting ready for the "Plastic Quiz" in which a lot will be revealed. There is one question in each plastic bag. You will read the question and try to answer it in a pair or a group. Write down both the answer and the number of the question on your sheet of paper. Each pair starts with a different question. After one minute, I will clap my hands and you will pass the bag and question to your classmates on the right. You will continue in the same way until all the questions are answered by each pair. We will go through the answers together afterwards.

- Distribute the plastic bags with questions. After all the questions are answered by all the groups, go through the answers together. This activity is not a contest so all the proposals should be read out loud. Once you have finished, reveal the correct answers (see ***Attachment 2***)

Plastic Quiz Answers:

1. Plastics are made from crude oil. Most synthetic plastics are made of polyethylene which may be obtained from crude oil. Before synthetic plastics were discovered, shellac and animal horns were used.
2. More than 1.2 trillion plastic bags are used all over the world per year. This means on average 300 bags per adult or one million bags per minute on the world. We use a plastic bag on average 12 minutes before we throw it away. However, it won't degrade until 500-1000 years from now.
3. Waste recycling is a term referring to waste treatment, leading to its further use. Recycling allows us to save both renewable and non-renewable energy resources and in some cases reduces environmental impact. Recycling may be divided into two kinds: direct and indirect recycling. Direct recycling means that things are reused without any other modification (e. g. reuse of old car parts from scrapyards). Indirect recycling involves new processing of waste materials. Indirect recycling is usually very energy demanding, and may therefore sometimes raise environmental impact.
4. "Re-using" means that we may use some things regardless of their original purpose. For example, we can repeatedly use a PET bottle for water. New utilization is important, because industrial recycling is highly energy-consuming. Moreover, recycled goods have to be transported, causing air pollution.
5. After being used, most plastics end up in the oceans. According to a report publisher by Greenpeace in 2007, at least 267 sea species suffer after being entangled in plastic waste or eating it. It is estimated that about one million sea birds get entangled in plastic waste every day. If an animal dies after eating plastic, the material will return back to the environment once the body degrades, thus threatening other animals.
6. In all the countries listed (either in the whole country or in selected cities), free plastic bags in shops are banned. In Ireland, a high tax is imposed on plastic bags, reducing their consumption by up to 90 %. Import and use of thin plastic bags was completely banned in Rwanda in 2005. Plastic bags are also banned in Dhaka, the capital of Bangladesh, because they can block sewage.
7. It is estimated that each square kilometer of ocean surface contains on average of 17 500 pieces of plastic waste. The largest zone of floating waste is situated in northern Pacific Ocean. Due to ocean currents, a huge "garbage island" as large as 1/10 of the size of the Czech Republic emerged there. 80 % of the island's garbage was thrown into mainland creeks and rivers or onto mainland beaches.
8. It depends on the students' imagination. Textile bags, wicker baskets, backpacks, paper bags etc. may be mentioned.

Quiz information source:
United Nations Environment Programme: http://www.unep.org/regionalseas/marinelitter
Greenpeace International: http://www.greenpeace.org/international/campaigns/oceans/

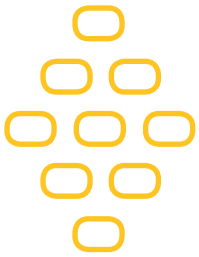
- When the quiz is over, ask the students:
  What surprised you most?
- Display the photos and tell the students to comment on them aloud. Ask them what got their attention. Tell them where the photos come from. In the end of the presentation, play a short animation displaying floating waste movements in the Pacific Ocean, caused by ocean currents. The island of plastic waste is located in the middle of a whirlpool near Hawaii.

REALIZATION OF MEANINGS / 20 min.

- Write down the two following questions on the board and give the students several minutes to answer them in pairs or groups:
  - *What can be done with plastic waste in the sea?*
  - *Is there anything we can do about?*

REFLECTION / 10 min.

- Collect students' ideas and explain the following task. Each group will be given a set of proposed solutions to the problem, some of the proposals may be replaced by students' ideas. The aim of each group is to discuss the efficiency of each proposed solution, to arrange cards with the proposed solutions and stick them on a sheet of paper in a "diamond" shape. Explain the "Diamond" method. The Diamond consists of five lines. The solutions are arranged according to efficiency, the most efficient solution being on the top and the least efficient at the bottom:



1 the best/most efficient solution

2 slightly less efficient solutions than the one on the 1st line

3 slightly less efficient solutions than the ones on the 2nd line

2 slightly less efficient solutions than the ones on the 3rd line

1 the least efficient solution

- Each group will be given glue, a white sheet of paper and a set of cards (***Attachment 3***). When the students are finished, ask them about the arrangement they have chosen. Discuss the importance of reduced consumption, reuse and rejection of plastic bags. The quiz information regarding the countries which have banned plastic bags may be recalled. Discuss the problems with recycling, waste incineration, landfill disposal, transport of waste to other countries (see ***Infobox)***.
- At the end of the class, have the students form a circle. Ask them what they think the most important information from today's class was.

Recommendation

- Ask the students what came to their minds when thinking about the "use plastic bags in a different way" alternative. *How could a plastic bag be used? Do you have any idea what can be made from plastic bags?* Let the students brainstorm and write their ideas on the board. The ideas may be used, for example, in art classes.
- Emotion painting may be used as an alternative to personal reflection. After displaying the pictures, the students can be given colored pencils/pastels/crayons and asked to express their feelings. Put the pictures side by side and let the students look the pictures over and comment on them.

Infobox

Waste Management in the Czech Republic

As a member of the EU, the Czech republic should strictly follow the following steps when managing waste: firstly, it is necessary to try to reduce the overall amount of waste produced. If waste is produced, it should be reused, recycled or incinerated in order to generate electricity. The last option should be landfill disposal.

Even though increased incineration negatively influences the environment, the incineration of waste in specialized incineration plants is much more environmentally friendly than burning waste at home in the garden. Non-combustible waste should be disposed of in landfills or transported to hazardous waste facilities.

Plastic Package Recycling

There are 38 companies dealing with waste sorting and recycling in the Czech Republic, recycling more than 60 % of all newly produced PET bottles (data from March 2010). The recycling industry focuses on staple and cable production (Silon Planá nad Lužnicí), fiber and non-woven fabric production (Re-plast, up to 2500 tons per month) etc.

In 2007, more than 1.1 million tons of plastic were made in the Czech Republic and 995 hundred thousand tons were consumed. The production of plastic waste in the Czech Republic has reached the same level as in the industrialised countries of Western Europe. By the way, the world's total production of plastic in 1949 was almost like the total production of plastic in the Czech Republic in 2007.

There are enough recycling facilities for plastic in the Czech Republic, producing various plastic products like noise barriers, grass pavers and pickets. Recycled plastic materials may also replace wood. Thus they may be found as parts of benches, terraces or playground equipment. It is, however, necessary to mention that these ways of re-using plastic are highly energy-consuming.

Source:

http://www.nazeleno.cz/

Useful links concerning floating garbage in the sea:
Greenpeace (2009): *The Trash Vortex*. [online] available at http://www.greenpeace.org/international/campaigns/oceans/pollution/trash-vortex/?MM_URL=http://oceans.greenpeace.org/en/our-oceans/pollution/trash-vortex
http://plasticpollutioncoalition.org
http://www.greatgarbagepatch.org/

Attachment 1

Plastic Quiz Questions:

1. *What are plastics made from?*
2. *How many plastic bags on average does one person use per year? How long on average do we use one plastic bag before we throw it away?*
3. *What is recycling? Can we recycle plastics? If so, how can we do that?*
4. *What's the difference between recycling and re-using?*
5. *Where do most plastics end up if not recycled?*
6. *Which countries banned free plastic bags in shops? Bangladesh, Rwanda, Israel, Canada, Maharashtra (a state in western India), Botswana, Kenya, Uganda, the Republic of South Africa, Taiwan, Singapore, Ireland, China.*
7. *How many pieces of plastic waste float on average on each square kilometer of the surface of the ocean?*
8. *What can be used instead of plastic bags?*

Attachment 2 – preview

source: Greenpeace ©

Manila Bay Cleaning, Philippines, 2006

source: Greenpeace ©

Manila Bay Cleaning, Philippines, 2006

source: Greenpeace ©

Manila Bay Cleaning, Philippines, 2006

source: Greenpeace ©

Plastic trash at a beach in Hawai, 2006

source: Greenpeace ©

Plastic trash in Hawai. The word „trash" is made from golf balls disgorged by the ocean. Plastic trash at a beach in Hawai, 2006

Attachment 3

Cards for the Diamond:

INCINERATE	THROW INTO A WASTE BIN FOR PLASTIC WASTE (RECYCLE)
REFUSE PLASTIC BAGS – SAY NO! IN SHOPS	BURY IN THE GROUND
TRANSPORT TO ANOTHER COUNTRY (E.G. TO CHINA)	USE PLASTIC BAGS AGAIN AND AGAIN
THROW IN UNSORTED WASTE	USE IN A DIFFERENT WAY
REDUCE CONSUMPTION	

MOBILE PHONE STORY

Goals:	Students analyse the life cycle of a mobile phone. Students assess positive and negative impacts on the individual stages of the life cycle of a mobile phone. Students search for a way of reducing negative impacts associated with the life cycle of a mobile phone.
Curriculum links:	Economics, Geography, Work Experience
Age:	13–18 years
Time:	45 minutes
Materials:	chart for each student *(Attachment 1)* 6 photographs (mining, use of cell phones and electronic waste) *(Attachment 2)* 3 texts from the stages in the life cycle of a mobile phone for each student *(Attachment 3)* stages in the life cycle of a product *(Attachment 4)*
Preparation:	Number or mark a set of three texts together *(Attachment 3)* so that the same number or symbol indicate three different parts of the text in the *Attachment*.

Procedure

EVOCATION / 15 min.

- Ask students to take out their cell phones and put them all on one table with a resulting heap of cell phones. Ask them about their spontaneous impressions: *What comes to your minds?* You can write down their free associations on a large sheet of paper on which you have placed the mobile phones or on a blackboard. Leave the phones there for the whole duration of the exercise.
- Hand out the chart *(Attachment 1)*. Students ponder the answers they share, and in pairs write down their ideas. If you think it is appropriate, you can recap the ideas together with the class and write them down on the blackboard. Ask students to keep the chart with them for now.
- Then distribute the photographs of mineral mines, use of cell phones and the journey of electronic waste around the world *(Attachment 2)* on the floor around the heap of mobile phones. Every student should select one picture that seems to be the most interesting to him/her. Groups that have formed around each picture shall discuss what is happening in it and where it could have probably been taken. Each group then shares their observations with another group. It is also possible that they share their observations with the whole class. Write down all interesting observations on the blackboard so that you can come back to them during the lesson.

REALIZATION OF MEANING 10 min.

- Proceed to the texts *(Attachment 3)*. Students split into three groups according to the segment to which their picture belongs (1. extraction and production, 2. consumption, 3. waste). Hand out the respective texts. Provide them with some time to study them.
- Students form groups according to the symbol of their text in which the readers from all three groups are represented. The task of the groups of three is to go back to the complete charts *(Attachment 1)* and to put the new information into one of them, based on the texts.

REFLECTION / 25 min.

- Informed by their charts and the texts, studied, students interpret the life cycle of a cell phone. Explain the task that is prepared for them and then hand out the work sheet with the phases of the life cycle of a mobile phone depicted *(Attachment 4)*. Their assignment is to name the individual phases and formulate the risks posed by them to people and the environment during the individual stages. If you have enough time, students can share their results in the form of a "square", where they promenade around the classroom and meet with at least three people to whom they talk about their conclusions. Or let a few ideas from each phase be voiced in front of the whole class.

- Ask the following: *In your opinion, which risk is the most serious one? How can you prevent it? Do you know of any examples where this could be happening?*
- You can start a discussion concerning one of the following questions:
  - *Negative impacts associated with products usually do not affect those who buy them. Who do they affect in the case of mobile phones? Why are these impacts not reflected in the price of a product?*
  - *What could be done to make the companies manufacture products with smaller adverse impacts on the environment and people?*
  - *If we bought fewer goods, would our standard of living be reduced? If yes, how exactly? In which other ways would it (not) change?*
- If you still have some time, pose the following question to the students: *How did they feel without their phones for 45 min? Could you live in the current society without a mobile phone?* Give students time for thinking about their answers. Define two parties in the class – one IN FAVOUR and one AGAINST. Students distribute themselves according to their answers. Ask them to reason for their positions.
- At the end, ask them to put their cell phones back on a heap as at the beginning. Tell them to remind themselves of what has happened throughout the lesson and what they have learned. Now everyone names one thing that he/she feels to be the most important when looking at the heap.

Sources of texts:

Kulíšková, Šárka, Trojanová, Alžběta (2010): *Čím je mobilní telefon mobilní? Výukový program*. Kostelecké Horky: Civic association INEX-SDA.

Brabec, Jaroslav (2009): Mobilní telefony se také stanou odpadem. *Tretiruka.cz*. [online] Available from: http://www.tretiruka.cz/news/mobilni-telefony-se-take-stanou-odpadem-zajimava-cisla-a-suroviny-v-mobilnich-telefonech/ (accessed on August 14 2011).

Nokia (2011): *Materiály a chemické látky*. [online] Available from: http://www.nokia.cz/o-spolecnosti-nokia/zivotni-prostredi/spolecne-vytvarime/materialy-a-chemicke-latky (accessed on August 14 2011).

Greenpeace (2009): *Průvodce zelenější elektronikou*. [online] Available from: http://www.greenpeace.org/czech/kampane2/toxicke-zne-i-t-n3/pruvodce-setrnejsi-elektronikou (accessed on August 14 2011).

Svatoš, Jan (2009): „Válku v Kongu zastaví jen zájem lidí." *Rozvojovka*. [online] Available from:http://www.rozvojovka.cz/rozhovor-valku-v-kongu-zastavi-jen-zajem-lidi_223_706.htm (accessed on August 14 2011).

Other sources of information:

Reports on the web pages of MakeITfair [online] Available from: http://makeitfair.org/the-facts/reports (used on August 20 2011).

Attachment 1

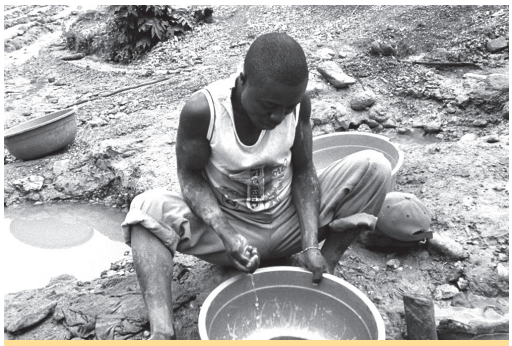
My mobile phone...	
What is it composed of?	
From which materials and minerals is it produced?	
From where are the minerals and processed components imported?	
What happens to the mobile phone when its life cycle is over?	
What impacts does it have on people and the environment?	

My mobile phone...	
What is it composed of?	
From which materials and minerals is it produced?	
From where are the minerals and processed components imported?	
What happens to the mobile phone when its life cycle is over?	
What impacts does it have on people and the environment?	

Attachment 2 – preview

source: Amnesty International ©

South Kivu mines, Democratic Republic of the Congo, 2009



source: Amnesty International ©

South Kivu mines, Democratic Republic of the Congo, 2009

source: Greenpeace ©

Women from the Siberian ethnic group of Nenets, Russia, Jamal peninsula, 2009

source: Greenpeace ©

Life with a cell phone, USA, 2010

source: Greenpeace ©

Electronic waste in China, the Guangzhou province, the city of Nanyang, 2005

source: Greenpeace ©

Electronic waste in China, the Guangzhou province, the city of Nanyang, 2005

Attachment 3

What does our mobile phone consist of?

A mobile phone contains several dozen metals (gold, nickel, silver, platinum, copper, chromium, tin, silicon and others). It contains microchips that use extremely hard and highly conductible elements. Starting roughly in the year 2000, the production of microchips has used a compound of columbite and tantalite termed coltan. Coltan is a matt black mineral ore from which niobium and tantalum are extracted. Due to its hardness and excellent conductibility, coltan is an important constituent in the manufacture of small electronic parts for cell phones, computers and the majority of modern consumer electronics.

It is estimated that almost 80 % of the world's deposits of coltan are located on the territory of Democratic Republic of the Congo. Between 1998 and 2003, the "African World War" was taking place here. Eight African countries and several dozen guerrilla groups were involved in the conflict. This war and the ensuing unrest, continuing until today, have claimed the lives of over 5 million people.

This conflict, which has been mainly about the control over natural wealth, has been fundamentally influenced by the world trade in minerals. The parties involved in the conflict have been chiefly fighting to gain control over the mines that generate huge profits. The war in the Congo has been in fact funded and sustained by illegal mining where the combatants were exporting minerals from the Congolese territory. The most important of them is coltan, since a great global demand for electronics caused a sharp hike in its price. Coltan is purchased especially by corporations from Europe and the USA.

In our hands

Even before the mobile phone sets out on its way to its future owner, the individual parts and minerals necessary for its production have already travelled a great deal. The antenna can be manufactured in Hong Kong, the printed board in Malaysia, microphone and battery in China, computer chips in Japan or Germany. The display is probably from South Korea and the keypad from Taiwan. Mobile phones are assembled for example in Ireland, Germany or Mexico.

Mobile phones are among the electronic gadgets that have one of the highest replacement rates. Almost two thirds of all mobiles are kept by their owners only for one or two years. Around 500 million people all over the world change their mobile phone every year.

Did you know that:

- In 2010, every 100 Europeans owned on average 125 SIM-cards? Out of every 100 inhabitants of Africa, 41 owned SIM-cards and out of every 100 Asians there were 66 SIM-card owners?
- The mean life-time of a computer in advanced countries fell from 6 years in 1997 to a mere 2 years in 2005?
- The life cycle of a mobile phone in economically advanced countries is under 2 years?
- Nokia launches a new mobile phone with state-of-the-art design and applications every 3 months?
- In the Czech Republic there are an estimated 5–7 million unused mobile phones?
- That up to 120 kilograms of gold, 45 kilograms of palladium, 1,250 kg of silver and 45,000 kg of copper,19,000 kg could be recovered from the batteries from just one of the five million unused Czech mobile phones?

Where should it go?

More and more electronics are used globally every year. This causes a huge increase in the amount of waste that contains dangerous toxic chemicals and heavy metals which can be safely disposed of or recycled only with great difficulty.

The amount of electronic waste is rising sharply because people modernize their computers, mobile phones, TV sets, hi-fi sets, printers and other electronic gadgets faster than ever before. The biggest problems are caused by mobile phones and computers, since those are exchanged at the highest rate. In Europe, the amount of electronic waste is growing at a pace of 3–5 % per annum; i.e. almost three times as fast as the overall volume of waste. European countries anticipate that the production of their electronic waste will triple over the next five years.

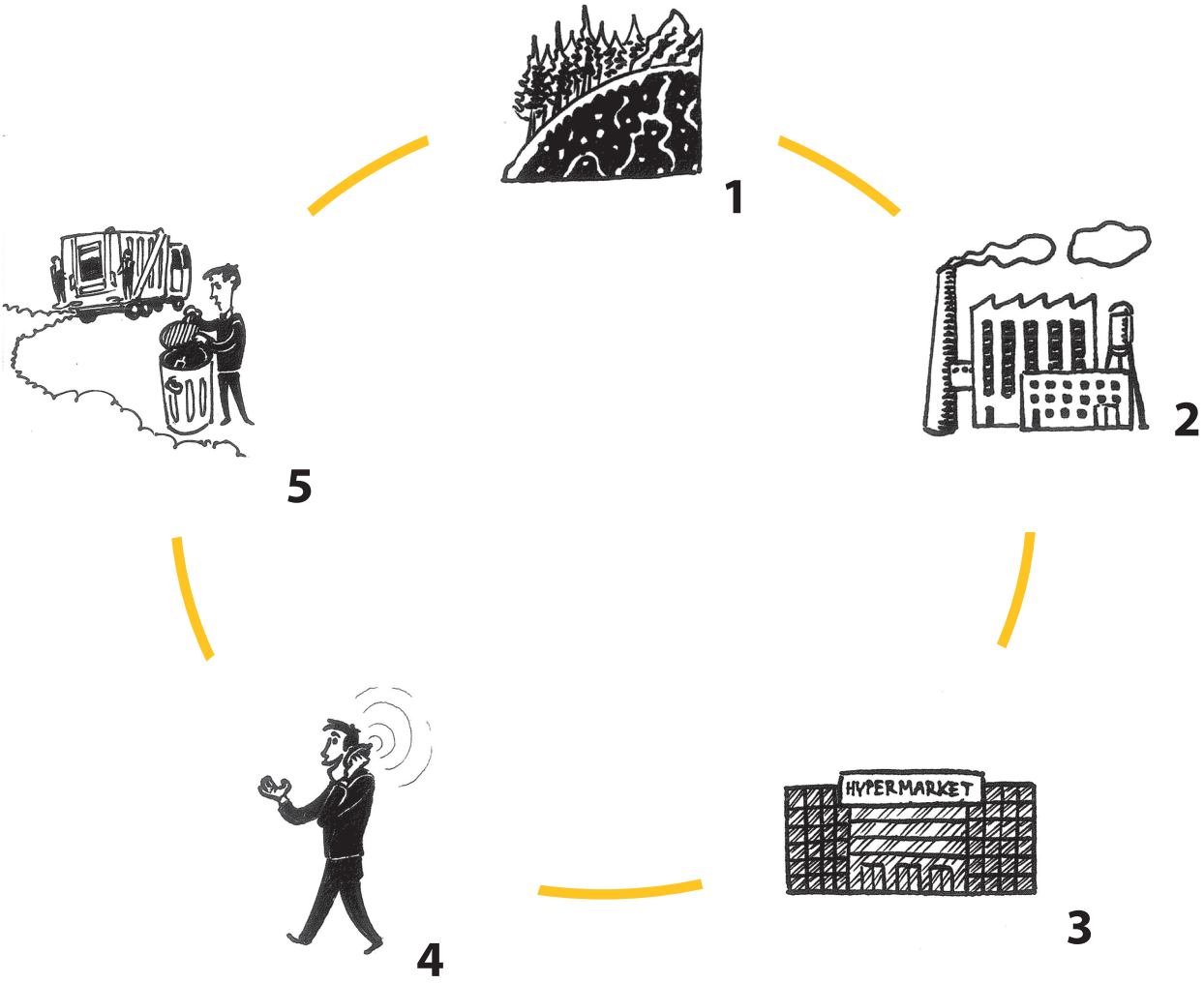
Electronic waste, e-waste, now constitutes up to 5 % of the domestic solid waste (globally). This is almost as much as the amount of discarded plastic covers. Electronic waste is, however, much more dangerous. It is not only produced by western economies. In Asia, around 12 million tons of old electronics are discarded every year.

Currently 30-50 million tons of electronic waste is produced globally every year. This amount is practically very hard to imagine. If we put the estimated annual volume of electronic waste into transport containers and load them onto a train, its length would be sufficient to encircle the Earth's Equator.

Once the electronics' life time expires, it is often illegally exported from Europe, USA and Japan into Asian (China, India) or African countries (Ghana, Nigeria, Egypt) where the processing of toxic waste is much less costly. Another good reason for export is the much weaker environmental laws and standards. Toxic waste destroys the environment and endangers the health of inhabitants. Poisonous substances produce pollution of the air, soil, ground and water and they are the underlying cause of the diseases inflicting the local people who process the waste.

Attachment 4

Life of a mobile phone



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VIRTUAL WATER

Goals:	Students understand the meaning of the expression virtual water. Students calculate and learn how much water is used to produce different products. Students consider their own role as consumers in the global system.
Curriculum links:	Mathematics, Social Studies, Geography
Age:	14+
Time:	45 minutes
Materials:	one big sheet of paper for brainstorming cut-out cards with different products (one set per group) *(Attachment 1)* product descriptions with mathematical tasks (1-3 per group depending on time and students' mathematical skills; choose those that are appropriate for your students and your culture) *(Attachment 2)*
Note:	A suitable follow-up lesson after this one could be Abuela Grillo.

Procedure

EVOCATION / 15 min.

- Tell students that today you will talk about water and how we use it. Explain that first you will start with the class brainstorming about the topic "water". Put a big blank paper on the board or on the wall and ask one or two students to write down everything they hear from other students in the class. Ask the students: What do we need the water for? Note down all ideas which will come out in the first two or three minutes. Then stop the brainstorming and ask: What if I ask you what do we NOT need the water for?
- Let the students brainstorm for a while. Do not comment on students' ideas; encourage them to produce as many ideas as possible. No idea is wrong in this activity. Do not spend more than 5 minutes total on this pair of questions.
- To prepare students for the following activity, ask them:
  What do you think is the connection between water and the products which we use?
- After a few students' ideas, divide students into small groups. Tell them: Each group will get a set of cut-out cards with different products. To make all these products, water is used in the process. Your task will be to put the cards in the order depending on how much water you think is used to make the products. The most water intensive products will be at one end, the least water intensive products at the other. You should consider all stages of production and all the inputs. You have 3 minutes to complete the activity.
- Then hand out the cut-out cards with the products *(Attachment 1)* and tell the groups to start working. (5 mins)
- Class discussion: After a few minutes, tell students to stop and quickly ask them the following questions. (Don't reveal the correct answers yet!)
  - *Which of the products on the cards do you think needs the most water to be produced? Why? And which one do you think is the least water intensive?*
  - *How much water (how many litres) do you think is used to produce some of the products?*
- Don't spend too much time discussing various products as you will talk about the results later in the lesson. Tell students that they will now learn more about this and will find out what the correct answers are. (5 mins)

REALIZATION OF MEANING
20 min.

- Explain that now each group gets a description of one of the products they have just discussed which includes a mathematical task. They will need to read the information about the product and then calculate how much water is needed to produce it *(Attachment 2)*. Distribute the tasks so that each group is working just with one. If you have enough time or if some groups are faster than the others, you can give them more than one task to read and solve. (7 mins)

REALIZATION OF MEANING / 20 min.

- While the groups are working on their tasks, draw a long line on the board like this one:

0 litres ——————————————— **16 000 litres**

- When all the groups finish, ask them to write the products from their tasks in their respective positions on the line on the board. This way they will check whether they have done the calculations correctly and at the same time everybody will see the order of the products according to the water intensity (3 mins).

Key to mathematical tasks from Attachment 2:

rice	2300 / 0.67 = 3 432 litres = approx. 3 400 litres
sugr	175 / 0.11 = 1 590 litres
tea	2400 / 0.26 x 0.003 = 27.69 litres = approx. 30 litres
beef	(3060 + 24 + 7) / 200 x 1000 = 15 455 litres = approx. 15 500 litres
paper	6000 / 10 / 300 x 0.005 x 1000 = 10 litres
cotton	(3600 / 0.35 / 0.9 + 30 + 140 + 190) x 0.25 = 2 947 litres = approx. 2 900 litres

- Focus the class's attention on the line on the board. To learn more about each of the products, ask all the groups to share some information about the products they worked on (e.g. the country where the production takes place, the amount of water used for various stages in the production process, possible problems related to the production process, any other extra information they find interesting.) At this point, you should also add the remaining products from the previous activity on the line. (10 mins)
- The cards also include a photograph of the product and a map showing where part of the production takes place. This should help students to realize the global interconnectedness as some of the products are produced and consumed in different parts of the world.

REFLECTION / 10 min.

- Ask students to formulate what the term "virtual water" means. After the previous activity they should be able to deduce the meaning of the term. If there are any doubts, explain them that virtual water is the amount of water that is used in the production process of a particular product. (2 mins)
- Focus the class attention on the brainstorming list of ideas. Let them think once again about their previous answers to the question What do we NOT need the water for?. Ask them: Would you change any of the answers? (2 mins)
- Continue asking students the following questions (6 minutes):
  - *We now have the background knowledge and some particular information about the amount of virtual water in some products. What could such information be good for?*
  - *Is there anything that we as consumers of the products can do about some of the problems described in some of the stories of these products? If yes, what?*

  The aim of this discussion is to make students aware of the power which they have as consumers. The products they choose and buy affect people and environment in other parts of the world.

Recommendations

As a homework or extension activity the students may write a short answer to the question: How am I connected to the rest of the world through water?

Infobox

PRODUCT	VIRTUAL WATER (V LITRECH)	PRODUCT	VIRTUAL WATER (V LITRECH)
bottled water (1l)	9	sugar (1kg)	1590
an A4 sheet of paper	10	a cotton shirt	2900
a potato	25	rice (1kg)	3400
a cup of tea (250 ml)	30	a pair of leather shoes	8000
an egg	135	a pair of jeans	11800
a glass of milk (200 ml)	200	beef (1kg)	15500

Source: Hoekstra, Chapagain 2008: 15, 119; www.waterfootpring.org (retrieved 9 Jan 2011)

Infobox – Virtual water (water in products)

Virtual water is the amount of water used to produce a unit of a specific product and is introduced in the units of volume for the unit of a product (e.g. 1000 litres for 1 piece or kg). How water intensive the production of a product is depends on the area where it is produced and its climate conditions. For instance, if we compare the production of cotton, the amount of virtual water in a ton of cotton in China is 2 018 m^3, whereas in India it is 8 662 m^3. The virtual-water content of a product is the actual volume of water used to produce it, measured at the place of production.

To calculate the virtual water content of crops, water needed for irrigation together with water needed to produce fertilisers, pesticides and other processing are included.

Livestock products have a higher virtual-water content than crop products, because it includes virtual water in feed as well.

The highest virtual-water content is in industrial products and to calculate its amount is considered the most difficult. For further information including methods of calculation go to http://www.waterfootprint.org/

Source:

Hoekstra, A. Y., Chapagain, A. K. (2008): *Globalization of Water. Sharing the Planet's Freshwater Resources*, Blackwell Publishing.

Attachment 1

List of products:

BOTTLED WATER (1L)	SUGAR (1KG)
AN A4 SHEET OF PAPER	A COTTON SHIRT
A POTATO	RICE (1KG)
A CUP OF TEA (250 ML)	A PAIR OF LEATHER SHOES
AN EGG	A PAIR OF JEANS
A GLASS OF MILK (200 ML)	BEEF (1KG)

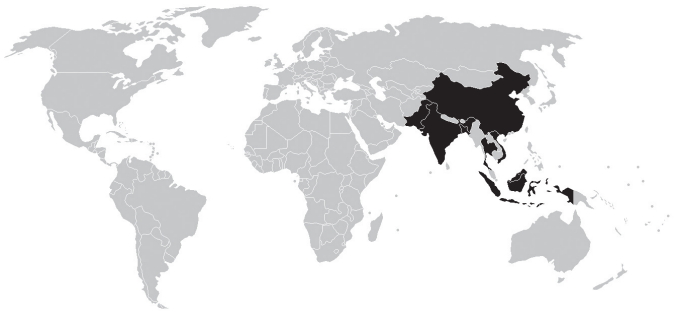
BOTTLED WATER (1L)	SUGAR (1KG)
AN A4 SHEET OF PAPER	A COTTON SHIRT
A POTATO	RICE (1KG)
A CUP OF TEA (250 ML)	A PAIR OF LEATHER SHOES
AN EGG	A PAIR OF JEANS
A GLASS OF MILK (200 ML)	BEEF (1KG)

Attachment 2

RICE

Rice is the second most produced cereal in the world. Today, rice is grown on every continent except Antarctica, but the biggest producer is Asia where 90 % of the world's rice is produced and consumed. The world's top rice producing countries are India, China, Indonesia, Thailand, Bangladesh and Vietnam.

Most rice is consumed in the same country where it is produced. Traditional rice exporters are Thailand, Vietnam, India and Pakistan. Rice is also grown in Europe. In fact, about two thirds of the rice consumed in the European Union is grown in Europe with Spain and Italy being the biggest producers. Most EU imports come from Thailand, India and Pakistan.



Almost all of the world's rice is grown on small farms and planted by hand. Unfortunately, small farmers often have to sell their production at very low prices which cause them problems.

In the shop we buy so-called ‚milled' rice in the form of white rice or broken rice. ‚Paddy' rice (the rice as harvested from the field) consumes 2 300 litres of water per kg. One kilo of paddy rice produces 0.67 kg of milled rice on average.

How much water does 1kg of milled rice need ?

SUGAR

Sugar can be produced from different plants, such as sugar cane or sugar beet. Nowadays, about 70 % of the world's supply of sugar comes from sugar cane, which is mainly produced in tropical areas. There is no difference between the end products of beet and cane sugar, which are both called white (or refined) sugar; but sugar cane can also be processed into brown sugar (sometimes called raw sugar). We consider here the case of sugar cane.

The top producers of sugar cane are Brazil and India. Brazil is also the world's biggest sugar exporter, followed by the European Union (where sugar beet is grown) and Australia.

Work on sugar cane plantations is hard and can also be dangerous. Workers use sharp machetes and sometimes they also work with hazardous chemicals. Often, the salaries for workers in the sugar cane sector are not enough for even basic needs. Over-irrigation and burning the cane fields are also problems.

It takes about 175 litres of water to produce 1 kg of sugar cane. About 11 % of the sugar cane is sugar, so that 1 kg of sugar cane gives 0.11 kg of sugar.

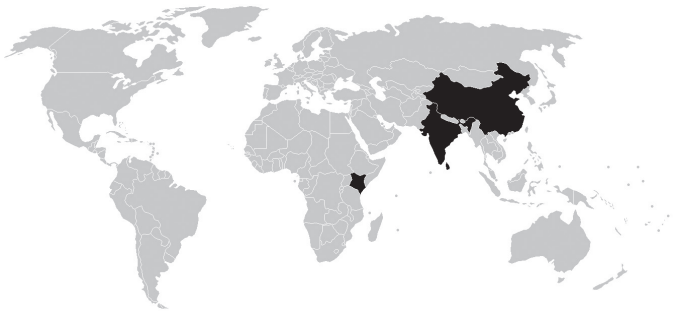
How many litres of water is thus required to produce 1 kg of refined sugar?

Attachment 2

TEA

Tea is the second most consumed drink in the world (after water) and is present in almost every culture. There are four main types of tea: white, green, oolong and black. However, these all come from the same plant called Camellia sinensis.

Tea bushes grow in a tropical or subtropical climate. Tea is made from leaves of the tea bush. Tea plantations are usually located on a mountain slope and the higher the plantation is, the better the quality of the tea.



People working on tea plantations often have very low wages and many of them are only employed on short-term contracts so they cannot be sure about their jobs. Also, picking tea leaves is a very tiring task and often the workers do not have any special work clothing or equipment.

The most important countries with tea plantations are China, India, Kenya and Sri Lanka which are also the largest tea exporters.

To produce 1 kg of fresh tealeaves we require 2 400 litres of water. One kg of fresh tealeaves gives 0.26 kg of packaged tea (black tea as we buy it in the shop). For a standard cup of tea (250 ml) we require 3 grams of black tea.

How many litres of water are required for one cup of tea (250 ml)?

BEEF

In industrial farming, it takes on average three years before the animal is killed to produce about 200 kg of boneless beef.

During these three years the animal consumes nearly 1 300 kg of grains (wheat, oats, barley, corn, dry peas, soya bean meal and other small grains) and 7 200 kg of roughage (pasture, dry hay, silage and other roughages). To produce this amount of feed requires about 3 060 m^3 of water on average. Additionally, the animal needs 24 m^3 of water for drinking and 7 m^3 of water for servicing.

How many litres of water are used to produce one kilogram of boneless beef?

Attachment 2

PAPER

Most people know that trees are the main source for paper production, but other materials and plants are also used. Recycling is very important too. However, the number of trees cut down and used to make paper is still enormous. Apart from cutting down trees, the chemicals used in paper production can also be very bad for the environment, especially when they get into water and soil.

photo: Anne Burgess

We assume here that one A4-sheet of paper is the regular 80-gram paper (80g/m^2). One such sheet has a weight of 0.005 kg.

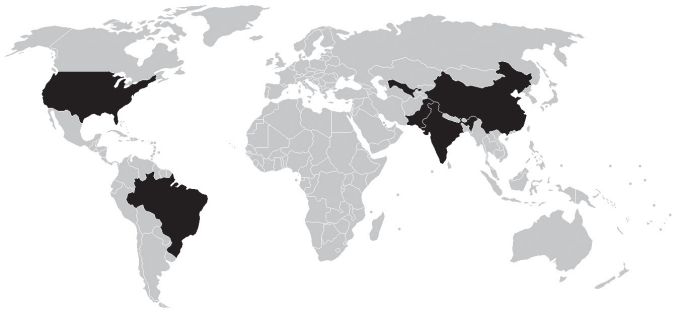
Further we assume that the paper is produced from wood. Consider a forest with transpiration (the process of water passing out from the leaves) of 6 000 m^3/ha every year. Suppose that the forest produces 10 m^3 of wood per hectare per year. Finally, account for the fact that 1 m^3 of wood gives 0.3 ton of paper.

How many litres of water are used to produce one A4-sheet of paper?

COTTON

Cotton grows in warm climates and most of the world's cotton comes from China, India, the United States, Pakistan, Brazil and Uzbekistan.

One of the biggest problems related to cotton production is a heavy use of chemicals, mostly those that protect the plants from various insects. These chemicals are very dangerous to both human health and the environment. Moreover, other chemicals are used during processing. This all leads to soil and water pollution.



A cotton shirt is made from cotton fabric, which is made from cotton lint, which comes from seed cotton, which is harvested from the cotton field. Indeed, before the final cotton textile gets to a consumer it goes through a number of processes and products.

The global average of water used to produce 1 ton of seed cotton is 3600m^3. The seed cotton is first processed into lint – we get only 350 kg of lint out of 1 000 kg of seed cotton. Then, after carding, spinning and weaving we get grey fabric – 1 000 kg of lint produces only 900 kg of grey fabric. Then it goes into wet processing (bleaching and dying) and finishes as the final printed cotton textile. Additionally, it requires about 30 m^3 per ton for bleaching, 140 m^3 per ton for dying and 190 m^3 per ton for printing. One cotton shirt has a weight of 250 gram.

How many litres of water are used to produce one cotton shirt?

HOW COME?

Goals:	Students apply the law of conservation of energy. Students consider the consumption of energy necessary to manufacture various products and try to find ways to reduce it.
Follow-up activity:	For selected countries, students compare the share of energy consumption coming from renewable sources. Students express the ideas which lead them to a classification of the countries.
Curriculum links:	Physics
Age:	14+
Number of Students:	18–30 students
Time:	45 minutes plus the Follow-up Activity (60 minutes)
Materials:	picture of a student *(Attachment 1)* cards displaying individual parts of energy transformation chains *(Attachment 2)* wrapping paper for each group crayons or markers teaching aids (internet, textbooks) pencils, paper chart of countries *(Attachment 3)*
Note:	The activity may serve as a summary for teaching about the forms of force or energy, or it can serve as motivation for - and an introduction to – studying the problem. In the latter case it will be necessary to provide students with sufficient materials on the forms of energy and to give them more time.

Procedure

EVOCATION / 10 min.

- Present the topic. The students will deal with energy – its forms, transformations and especially the law of conservation of energy. Each group of four students will get a wrapping paper with a glued picture of a student (Attachment 1) sitting in a train and working with a laptop. Ask the students to tell you what's happening in the picture and write key words on the board (e. g. sitting, travelling, working, breathing…).
- Then tell your students: Draw or paint everything that is, in your opinion, necessary for the action to take place. (e. g. electric lines so that the train can move, a power plant to produce energy, the food which the student ate in order to be able to work etc.) Using proper questions, we may lead the students to think further: *How come his laptop works? What causes the train to get closer to its destination? Why doesn't it freeze? Why is the student able to work?*
- After they run out of the ideas, ask the students if they think that they have come up with everything that causes the action. Let's look at the whole problem in detail.

REALIZATION OF MEANING / 20 min.

- Split the students into six groups (3-5 students in each group). The aim of each group is to arrange their pictures so that the chains they've made correspond to the gradual transformation of energy from the initial resource to residual energy radiation. The resulting chains will be evaluated by the students according to the energy demand of the final product. Each group will get two sets of pictures (each group should get one long and one short chain, and these two chains should be as different from each other as possible). The chains illustrate the gradual transformation of energy from its creation to its residual radiation. The students can use teaching aids (internet, textbooks) to clarify uncertainties. If they fail to do so, reveal the initial energy resource – the Big Bang.
- At the end of the activity, each group is to present their chains to the others. They will put individual pictures on a sheet of paper and describe what's happening in the chain in their own words. Point out in advance that each member of the group should take part in the presentation.

- During the work, make sure that the students use physical descriptions of the various forms of energy.
- After all the groups finish their presentations, some time should be devoted to questions and clarifying problems.

Examples of Interpretation:

The basic structures of the universe was created by the Big Bang- protons, neutrons, simple chemical elements. Inside the Sun, the simple chemical elements combine, producing energy (according to the equation $E=mc^2$). The energy is radiated in the form of electromagnetic radiation and hits the Earth's surface. Light energy transforms to heat energy here – the Earth's surface warms up unequally. Temperature differences manifest themselves in differences in atmospheric pressure (heat energy transforms to potential energy), causing air movement = wind (potential energy is transformed into kinetic energy). The wind spins windmill blades (the kinetic energy of the blades is transformed into the electromagnetic energy of an electric motor). The electromagnetic energy is distributed through electric lines in the form of waves, supplying the laptop. In the laptop, the electromagnetic energy is transformed into light emission and heat. These are the final energy forms which are radiated back into space in the form of electromagnetic radiation with a long wavelength. Apart from the aforementioned process, energy losses occur during transformation, usually in the form of heat.

Splitting Cards into Groups

Group A

Big Bang Sun horsetail oil rig gas piping gas burner cooked food man running

Big Bang Sun green plant herbivore meat on a plate man running

Group B

Big Bang Sun sea water evaporation unequal warming of land and water surfaces cloud rain waterfall with a hydroelectric power plant electric lines can

Big Bang star uranium nuclear power plant electric lines washing machine

Group C

Big Bang Sun sea water evaporation unequal warming of land and water surfaces clouds rain dam turbine electric lines light bulb

Big Bang Sun horsetail coal mine boiler house heating/thermometer

Group D

Big Bang solar system Moon in its orbit tidal power plant electric lines electric kettle

Big Bnag star – gold brick mobile phone

Big Bang Sun tree book

Group E

Big Bang Sun banana tree ship fruit ripening room banana in a shop

Big Bang Sun solar panel electric lines mobile phone

Big Bang Sun tree fire

Group F

Big Bang Sun horsetail oil rig barrel of oil car

Big Bang Sun unequal warming of land and water surfaces wind wind power plant electric lines laptop

Note for teachers: Group D has the most difficult chains. Suitable for fans of physics.

REFLEXE / 15 min.

- The reflection on the activity comes next. After the detective work, let's have a look at what we found out. First, let the students make their comments freely: What are your impressions from the activity? What are your ideas? Then ask complementary questions:
  – *Where does energy in this light/computer… come from?*
  – *How much energy is available for us (me, mankind …)? Is the total amount of energy limited? If so, by what?*
  – *Which forms of energy transformation are the most convenient? Why and for whom?*
  – *How could the energy demand of some products be reduced?*

- The last part of the reflection is individual. Each student will consider which of his activities is the most energy-consuming and will suggest how to reduce this energy consumption. Both should be written on post-its. The whole class may examine the post-its afterwards. If there's enough time, the students may present their ideas to the rest of the class. The list of the ideas may be put on the notice board.
- At the end of the class, have the students form a circle. Each student expresses one idea that he has taken from the activity (his/her "idea of the day").

Recommendations

- If the interpretation of energy transformation in the form of a chain is too difficult for the students, they may be provided with a list of all energy forms:

  kinetic

  potential

  heat

  electromagnetic radiation

  binding energy

  nuclear

  Their task is slightly easier then. For each transformation, they are supposed to choose the corresponding form of energy from the list. However, creative thinking is seriously limited.
- Follow-up Activity: The students may arrange the selected countries according the share of their energy consumption which comes from renewable sources. Discuss the reasons for their decisions. Correct their guesses using the chart. Ask them: What surprised you? What ideas influenced your guesses? How do your guesses differ from reality?

Infobox

From the physical point of view, one cannot speak about renewable and non-renewable energy resources. Present knowledge does not allow us to determine whether the Big Bang was the moment of energy creation or whether the energy was transformed from some previous form. However, the law of conservation of energy holds true otherwise. There are two kinds of energy resources accessible to mankind – the energy that has been stored on the Earth for the 5 billion years of its evolution (coal, crude oil, natural gas, uranium, other elements (gold, copper); geothermal energy) and the energy that reaches the Earth continuously (solar radiation and the wind it causes, waves, circulation of water; tidal power).

Mankind is currently using mostly its "batteries" (the energy stored during the evolution of the Earth). "Immediate" energy makes up less than 1/8 of energy use. From this point of view, the contemporary state of affairs seems to be untenable. The second conclusion we can make is that there is a certain maximum amount of energy available to us (in the case of solar energy it is roughly 1 373 W/m^2) which seems to limit our further development.

		TOTAL CONSUMPTION	CONSUMPTION PER CAPITA	NON-RENEWABLE ENERGY CONSUMPTION SHARE [%]			
RANK	COUNTRY	KILOTONNE OF OIL EQUIVALENT [KTOE]	KILOTONNE OF OIL EQUIVALENT [KTOE] PER CAPITA	COAL	OIL	NATURAL GAS	NUCLEAR ENERGY
1	Congo, Dem Rep	17,121	295	1.5	3.2	0.0	0.0
2	Mozambique	8,739	516	0.0	6.1	0.2	0.0
3	Tanzania	19,013	532	0.2	6.8	0.6	0.0
7	Paraguay	7,744	673	0.0	15.0	0.0	0.0
15	Iceland	3,612	12,209	2.7	24.3	0.0	0.0
34	Tajikistan	3,437	531	1.3	42.9	14.1	0.0
39	Norway	33,840	7,153	2.3	44.7	15.2	0.0
44	India	536,948	491	38.7	23.9	5.4	0.8
56	Austria	33,229	4,135	12.1	43.4	24.6	0.0
61	China	1,717,683	1,316	63.3	18.5	2.3	0.8
67	World	11,403,258	1,778	25.4	35.1	20.7	6.3
69	Denmark	18,542	3,634	20.0	44.2	23.7	0.0
71	Venezuela	60,935	2,293	0.1	50.4	38.1	0.0
90	Spain	143,869	3,340	14.2	49.5	20.7	10.4
92	Germany	343,169	4,187	23.8	35.9	23.6	12.4
94	United States	2,329,669	7,886	24.0	40.9	21.8	9.1
101	Czech Rep	46,078	4,419	43.9	21.6	16.7	14.0
103	Russian Federation	644,323	4,519	16.0	20.7	54.3	6.1
104	Japan	526,740	4,135	21.1	47.6	13.4	15.1
108	Netherlands	79,363	5,049	10.3	42.1	44.5	1.3
112	United Kingdom	232,707	3,895	16.3	36.4	36.8	9.1
118	Ukraine	143,954	3,043	25.9	10.3	46.9	16.1
125	Iraq	30,640	1,067	0.0	92.7	7.1	0.0
128	United Arab Emirates	46,920	10,354	0.0	27.9	72.1	0.0

RENEWABLE ENERGY CONSUMPTION SHARE [%]					
HYDROELECTRIC POWER PLANTS	SOLID FUELS	BIOGAS AND BIOMASS	GEOTHERMAL ENERGY	SOLAR, WIND AND TIDAL ENERGY	TOTAL RENEWABLE RESOURCES
3.7	91.6	0.0	0.0	0.0	95.4
13.1	80.6	0.0	0.0	0.0	93.7
0.8	91.6	0.0	0.0	0.0	92.4
56.8	28.0	0.2	0.0	0.0	85.0
16.7	0.0	0.0	56.2	0.0	73.0
41.8	0.0	0.0	0.0	0.0	41.8
34.5	3.2	0.1	0.0	0.1	37.8
1.6	29.4	0.0	0.0	0.1	31.1
9.3	9.9	0.3	0.1	0.3	19.9
2.0	12.8	0.2	0.0	0.0	15.0
2.2	9.6	0.3	0.4	0.1	12.5
0.0	8.9	0.5	0.0	2.6	12.0
10.6	0.9	0.0	0.0	0.0	11.5
1.1	2.9	0.4	0.0	0.8	5.1
0.5	2.3	1.0	0.0	0.5	4.4
1.0	2.3	0.5	0.4	0.1	4.3
0.4	3.2	0.1	0.0	0.0	3.7
2.3	0.5	0.0	0.1	0.0	2.9
1.2	0.9	0.0	0.6	0.1	2.9
0.0	1.0	0.6	0.0	0.2	1.8
0.2	0.5	0.6	0.0	0.1	1.4
0.7	0.2	0.0	0.0	0.0	0.9
0.1	0.1	0.0	0.0	0.0	0.2
0.0	0.0	0.0	0.0	0.0	0.0

The aforementioned chart shows the energy consumption of selected countries. The data are from 2005, and 138 countries were observed. The countries are arranged in descending order according to what share of their energy consumption is from renewable sources. Developing countries are apparently at the top of the list with more than 90 percent of the energy they consume coming from renewable sources. The main part of their energy consumption mix consists of solid fuels, especially wood and dried animal excrement.

The countries which use their unique energetic potential are also at the top of the list – Paraguay, Tajikistan and Norway with their hydroelectric power plants and Iceland with its geothermal fields. Due to the massive amount of geothermal energy easily accessible in Iceland, energy-hungry industries like aluminium production have developed there.

Industrially developed countries can be found mostly in the second half of the chart. Their industry is based on consumption of "energy batteries" –burning of fossil fuels. Due to their geographical position, the countries from the Arabian peninsula can be found at the bottom of the list.

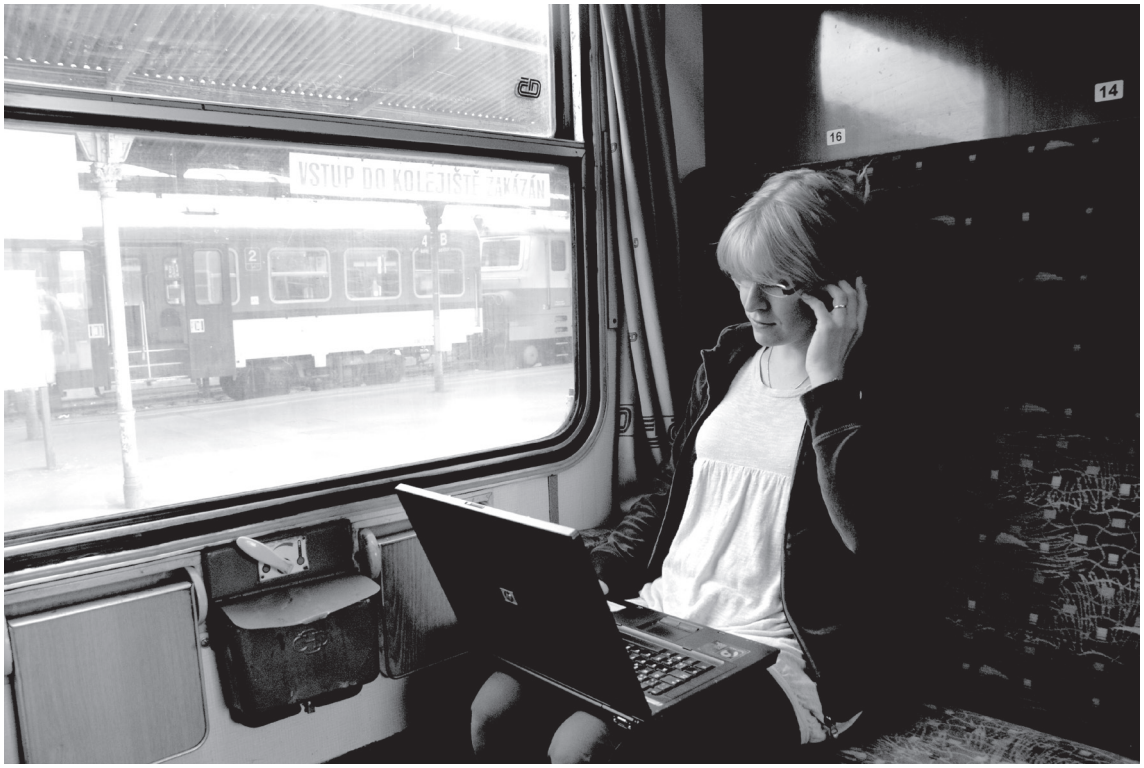
In 2005, the world average for share of energy consumption coming from renewable sources was only 12.5 %. This means that only 1/8 of total energy consumption originated from renewable resources.

Since 2005, the situation has changed radically. The share for renewable sources keeps growing (almost half of newly implemented energy resources are from renewable sources). Apart from the renewable energy sources, it is also necessary to monitor the total amount of energy consumed. For even though the monitored share is growing, the amount of non-renewable energy consumption is still growing due to growing total energy consumption. Most experts expect this tendency to change after 2030.

Source:

World Resource Institute (2011) [online] available at www.earthtrends.wri.org. (quoted 24/07/2011)

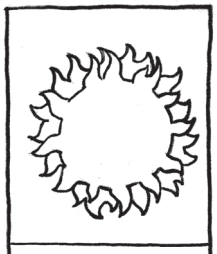
Attachment 1 – preview

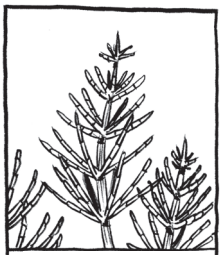


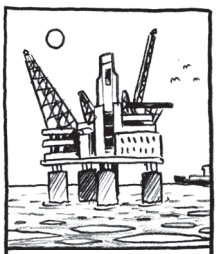
Attachment 2

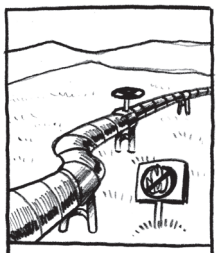
Group A

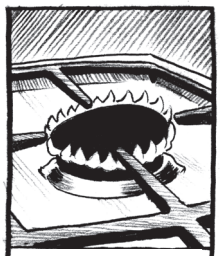

Big Bang


Sun


horsetail

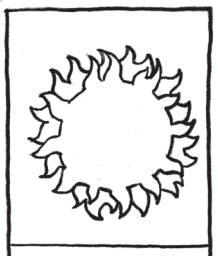

oil rig


gas piping


gas burner

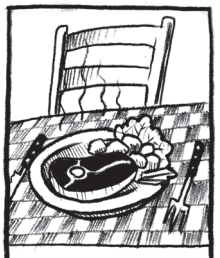

cooked food


Big Bang


Sun


green plant

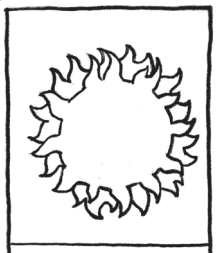

herbivore


meat on plate

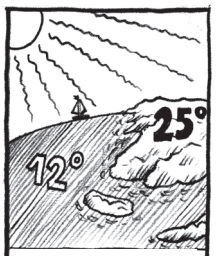

man running

Group B

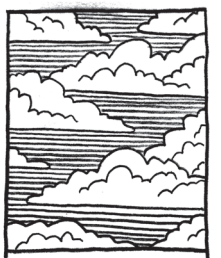

Big Bang


Sun


sea water evaporation

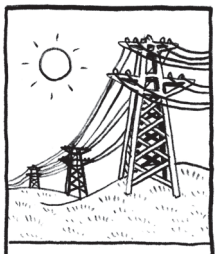


unequal warming of land and water surfaces


clouds

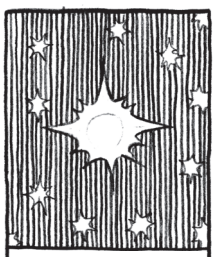

rain


waterfall with hydro-electric power plant

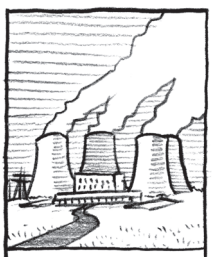

electric lines

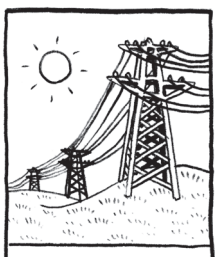

can

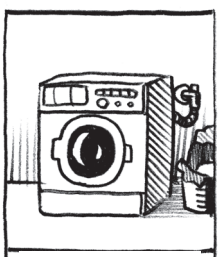

Big Bang


star


uranium

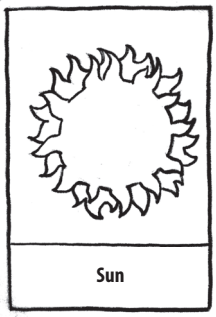

nuclear power plant


electric lines

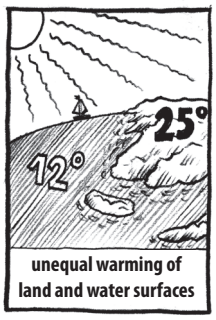

washing machine

Group C


Big Bang

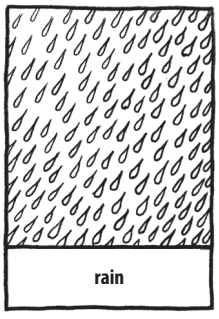

Sun


sea water evaporation

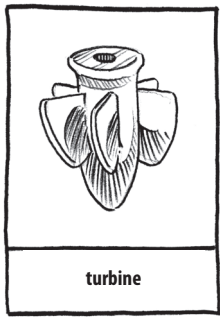


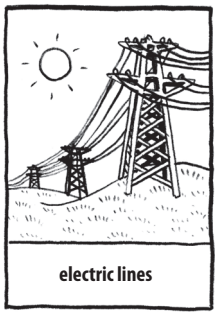
unequal warming of land and water surfaces

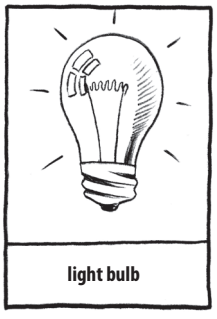

clouds


rain

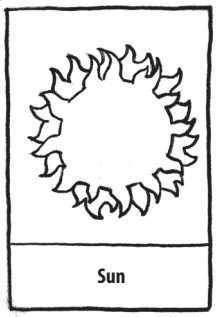

dam

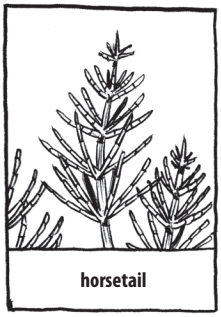

turbine


electric lines

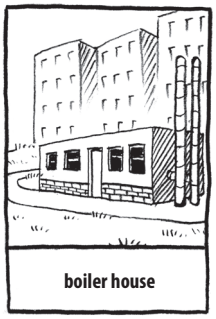

light bulb

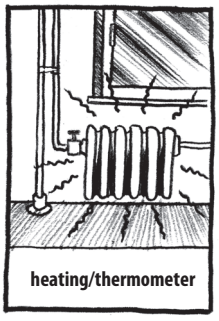

Big Bang


Sun


horsetail

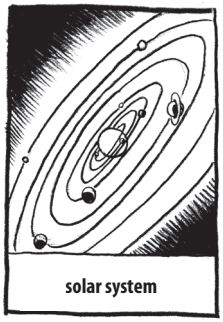

coal mine

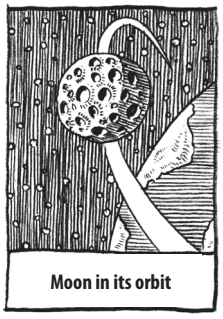

boiler house

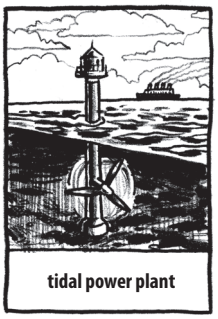

heating/thermometer

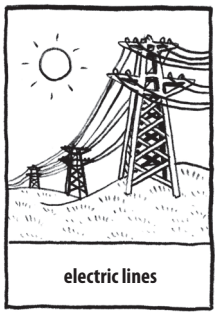
Group D

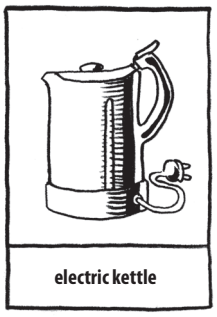

Big Bang


solar system


Moon in its orbit


tidal power plant


electric lines


electric kettle

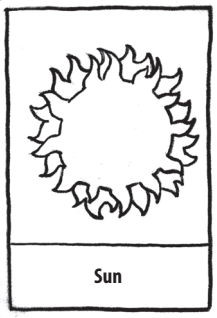

Big Bang

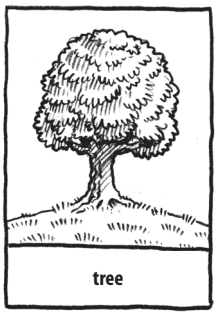

star

gold brick


mobile phone


Big Bang

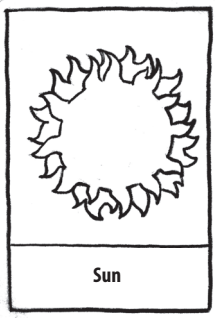

Sun

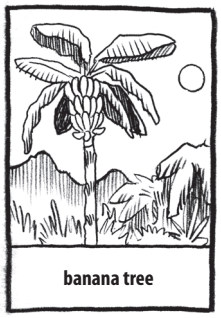

tree

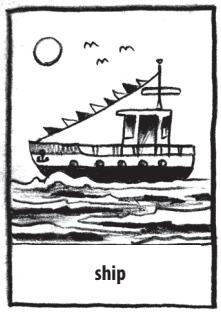
book

Group E

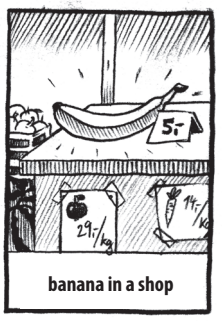

Big Bang


Sun


banana tree

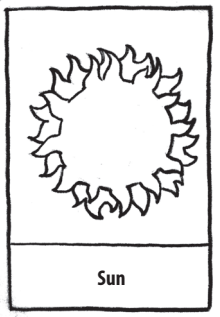

ship

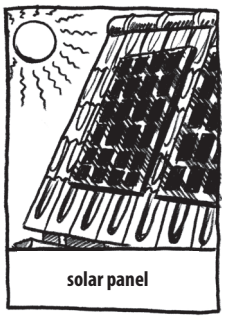
fruit ripening room

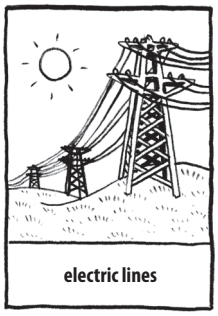


banana in a shop


Big Bang

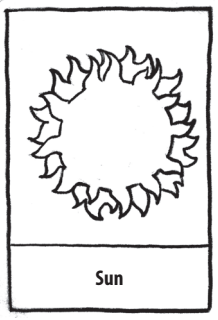

Sun

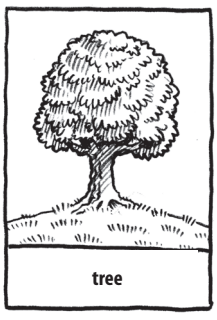

solar panel


electric lines


mobile phone


Big Bang

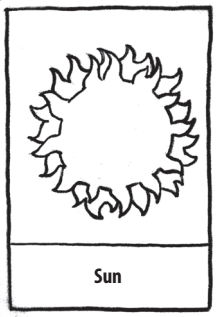

Sun

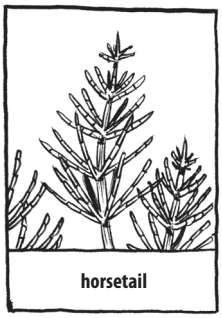

tree


fire

Group F

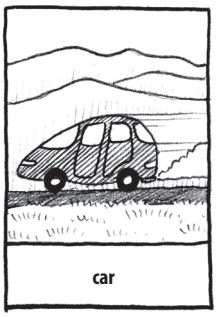

Big Bang


Sun

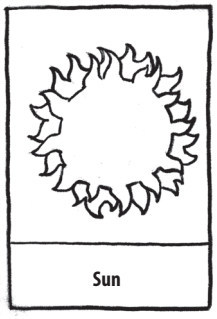

horsetail

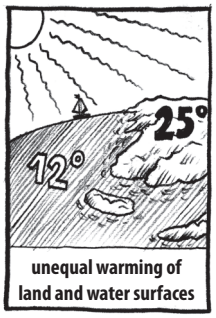

oil rig

barrel of oil


car

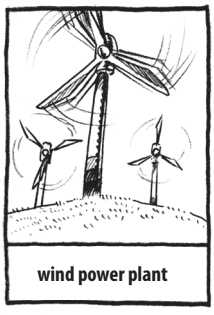

Big Bang

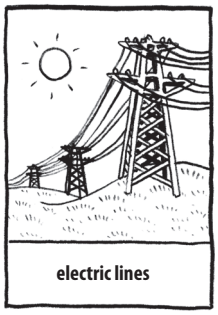

Sun

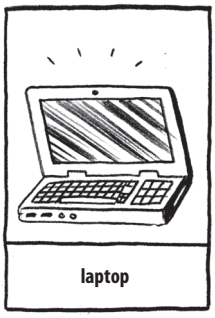


unequal warming of land and water surfaces


wind


wind power plant


electric lines


laptop

Attachment 3

CONGO DEMOCRATIC REPUBLIC	MOZAMBIQUE	TANZANIA
PARAGUAY	ICELAND	TAJIKISTAN
NORWAY	INDIA	AUSTRIA
CHINA	WORLD	DENMARK
VENEZUELA	SPAIN	GERMANY
UNITED STATES	CZECH REPUBLIC	RUSSIAN FEDERATION
JAPAN	NETHERLANDS	UNITED KINGDOM
UKRAINE	IRAQ	UNITED ARAB EMIRATES

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MEMO GAME

Goals:	Students are motivated to analyse the connections between everyday items and specific social, economic and environmental problems in the countries of the global South. Students determine the relevance of individual impacts and state reasons for their trust or distrust regarding the relationships presented.
Curriculum links:	Social Studies, Biology, Geography
Age:	13+
Time:	45 minutes
Materials:	4 × memory cards *(Attachment 1)* reflection charts *(Attachment 2)* boards and coloured chalks or a large sheet of brown or flipchart paper and coloured markers (ideally 4–7 colours)
Preparation:	Prepare 4 memory card sets and divide the pairs of each set. Then mix the cards.
Note:	The lesson is suitable as an introduction or summary to the series on the negative impacts of consumption because it concerns several topics. The lesson can be used also as a way for students to decide which topic they would like to critically address in greater detail in the coming lessons. The other lessons selected by topic, e.g. the Fragile Travellers, Virtual Water, Mobile Phone Story etc., are suitable as follow-up activities.

Procedure

EVOCATION / 10 min.

- *Now we shall deal with the most ordinary things. Try to make a list of at least 25 items that you or your parents buy routinely (including foodstuffs) or with which you are in contact on a daily basis.* Write on the board everything mentioned by the students.
- Ask the following questions: *Which of these items were completely produced in your country? Circle these items.* If you are not sure (it is of no use to start long debates), mark the item with a question mark. *Which items do you assume could be partly produced here and abroad?* Circle these items using another colour or another method. You can assign the task of circling the items to two students.
- Pose the following questions and let the answers be marked preferably using another colour or another method. You can ask about the reasons. *Which of these items can in some way be related to these issues as a result of their manufacturing process, transport or consumption?*
  Poverty and malnutrition
  Child labour
  Destruction of rainforests
  Undignified working conditions
  Lack of drinking water
  Pollution of the environment
  Excessive waste production
- Try to circle answers to each sub-question using another colour. If you do not have enough different colours, try to distinguish them in another way (e.g. by a double circle, underlining, etc.). It is a good idea to write a legend explaining the meaning of the respective colours so that you can go back to them in the reflection stage. Write and mark the words as the students say them – potential mistakes will be clarified later.

NEW MEANINGS / 15 min.

- Announce to the students that they will play a memory game. It should differ from an ordinary memory game only in the fact that the pairs are not formed by matching cards but by cards that show some interrelationship between ordinary consumer behaviour and a specific problem in another corner of the world. A pair is therefore always formed by a picture from the countries of the global North or the South (please make sure that the students understand these terms).
- Divide the students into several groups of 4 people. Give each group a memory card set (each group should have 8 pairs; if you work with an entire class, each pair will occur in two groups) and ask the students to play as usual. The game should last maximum 15 minutes after the cards have been distributed. Notify the students 2 minutes before the end. If some groups have not finished, they should turn the cards over and match them together.
- At this moment students can lay out all the pairs in front of them. Assess the game together: *How did the game go? Who has "won"? How easy or difficult was it to match the pairs? Did someone match the cards incorrectly?*

REFLECTION / 20 min.

- Hand out the following chart to each group for reflection.

What do we already know?	What surprised us most?	What do we distrust?	What does not really concern us?	Which of the issues in question do we consider as the most serious?	What would we like to know more about?

- The chart should be completed by each group. They can mention as many issues as they wish. Inform the students that they will have to give reasons for their choices. If someone does strongly disagree with the majority, his or her opinion should also appear in the chart and the following presentation. Decide with the students how much time they will need for completing the chart. It should take between 5 and 10 minutes.
- When everybody has finished, let them present what they have written to the others. Proceed from the left to the right column and not by groups so that the last group does not become bored. Everybody should pay attention to all the information and particularly to the column "What do we distrust" or "What does not really concern us." Ask the group of authors as well as the other groups that agree to give reasons for what has been said. Give space also to contrasting opinions – why do they believe a piece of information or why do they relate to it. You can talk to students about your own ambiguities or doubts regarding what you see as the most serious issue etc. It must be clear however that this is your opinion and not a "correct answer". Inform the students of the links from which they can learn more (see below).
- If you use this lesson as an introductory one, let the students write down all of the matters they would like to explore further. Every student can subsequently make three dots next to the topics or questions that they would like to deal with in the following lessons.
- At the very end, return to the initial list of things. Clarify possible mistakes. Ask the students to come up to the list one by one and to mark everything else that (after the game) they feel could be related to ecological, economic and social issues. If there is an item for which the students did not find any negative impacts and if the item was not mentioned by the memory cards, try identifying similarities with issues that the game mentions (e.g. the list may include ice-cream which is produced from milk, animal products such as meat, and therefore related to the issue of rainforest destruction because the soy fed to the cows can contain soy lecithin; milk generally has a fairly high carbon footprint, etc.)
- Provide space for all comments, impressions and ideas.

Source:

On the individual topics generally
Rychtecká, Michaela (ed.) (2010): *Svět v nákupním košíku – případové studie dopadů spotřeby na rozvojové země*. [online] Available from: www.nazemi.cz (used on Sept. 13 2011).

Zelený kruh a Hnutí Duha (2005): *Česká stopa – ekologické a sociální dopady domácí spotřeby za našimi hranicemi*. [online] Available from: http://www.zelenykruh.cz/dokumenty/ceska-stopa.pdf.

Chmelař, Pavel, Rut, Ondřej (ed.) (2007): *Dopady naší spotřeby na rozvojové země*. [online] Available from: www.zelenykruh.cz/dokumenty/studie-dopady-spotreby.pdf.

Cotton and textile industry
Cisariková, Anna, Hošková, Kateřina, Rychtecká, Michaela (2010): *Ušili to na nás.* [online] Available from www.nazemi.cz (cit. on Sept. 13 2011).

Environmental Justice Foundation (2007): *Deadly chemicals in cotton*. [online] Available from: http://www.ejfoundation.org/pdf/the_deadly_chemicals_in_cotton.pdf (cit. on Sept 13 2011).

Other articles and surveys available from www.maquilasolidarity.org, www.sweatshopwatch.org.

Coltan
Čajka, Adam (2009): *Vliv světových cen primárních komodit na konflikt v Demokratické republice Kongo v letech 1998 až 2003*. Thesis. Brno: FSS MU.

Svatoš, Jan (2009): „Válku v Kongu zastaví jen zájem lidí". *Rozvojovka*. [online] Available from: http://www.rozvojovka.cz/rozhovor-valku-v-kongu-zastavi-jen-zajem-lidi_223_706.htm (cit. on Sept. 13 2011).

Reports on the website of MakeITfair. [online] Available from: http://makeitfair.org/the-facts/reports (cit. on Aug. 20 2011).

Vesperini, Helen (2001): „Congo's coltan rush". *BBC NEWs*. [online] Available from: http://news.bbc.co.uk/2/hi/africa/1468772.stm (cit. on Sept. 13 2011).

Electronic waste
Greenpeace (2009): *PC za sebou nechávají herní konzole v toxickém oparu*. [online] Available from: www.greenpeace.org/czech/cz/news/pc-za-sebou-nechavaji (cit. on Sept. 10 2011).

More articles are available from http://www.greenpeace.org and accessible with the password "e-waste".

The operation of Coca-Cola is monitored by the following organizations
Lok Samiti: *Campaign against the Coca-Cola plant in Mehdiganj.* [online] Available from: http://www.loksamiti.org/index_files/anti_coke.htm

www.indiaresource.org

Rainforests
www.rainforests.mongabay.com

Palm oil
Greenpeace International (2010): *Caught red handed*. [online] Available from: http://www.greenpeace.org/international/Global/international/planet-2/report/2010/3/caught-red-handed-how-nestle.pdf (cit. on Sept. 9 2011).

Paper – eucalyptus cellulose:
PAD international seminar: *Case Systematization. Eucalyptus / Aracruz celulose*. [online] Available from: http://www.fase.org.br/projetos/clientes/noar/noar/UserFiles/18/File/Eucalipto%20e%20Aracruz%20Celulose%20Ingles.pdf (cit. 9. 9. 2011).

Soy
Compassion in world farming. Reports and Resources. [online] Available from: www.eatlessmeat.org (used on Sept. 13 2011).

La soya mata – Soy kills. [online] Available from: http://lasojamata.iskra.net (used on Sept. 13 2011).

Footballs
ILRF (2010): *Missed the Goal for workers: The reality of soccer ball stitches in Pakistan, India, China and Thailand.* [online] Available from: http://cleanclothes.org/documents/ILRF_soccerball_report.pdf (cit. on Sept. 9 2010).

Child Labour in Football Stitching Activity in India. A case study of Meerut Disctrict in Uttar Pradesh. [online] Available from: www.laborrights.org/sites/default/files/publications-and-resources/FOOTBALLREPORT2008.pdf (used on Sept. 13 2011).

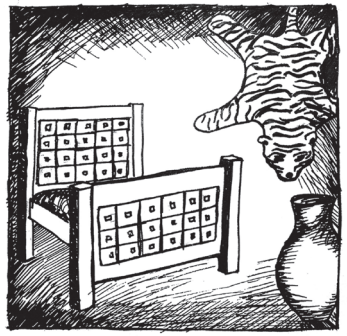
Flowers
Kosová, Kateřina (2006): *Riskantní krása květin*. Thesis. Brno: FSS MU.

www.flowers-for-human-dignity.org

Toward the end of 2008, 13.6 million mobile numbers were registered in the CR. This means that each citizen, including infants, has more than one mobile phone number. A growing number of people also own several mobile devices.

Website of Coca-Cola CR states that "the popularity of Coca-Cola is obvious from the fact that the daily consumption of just the Coke beverage amounts to 606 million glasses, i.e. 143 million litres." The amount of drinking water necessary for the production of 1 litre of Coke is 3.12 litres.

In the Czech Republic, one person consumes 2.5 kg of chocolate on average per year. The average annual harvest of one cocoa plant, (30–50 fruits per year) is enough to produce three large chocolate bars.



At present, the market with exotic wood products is quickly expanding here. The wood originating from rainforests is imported here from South America, Asia, Africa and Australia.

Growing demand for mobile phones goes hand in hand with the need for coltan – raw material that contains niobium and tantalum essential for the production of the majority of small electronic gadgets. The Democratic Republic of Congo has the largest coltan deposits in the world. A short time ago, a five-year-long war ended over their control that cost the lives of 5 million people.

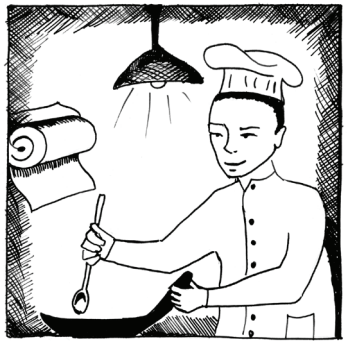
The operation of one of the largest Coca-Cola bottling plants in India consumes ca. 5 million litres of drinking water daily. This causes the drying of the surrounding wells and a lack of drinking water for the local people.

At present, around 50 million children under the age of 11 are forced to work in conditions that are directly harmful to their health. A cocoa plantation is an example of such working conditions. Children working on cocoa plantations have never in their lives tasted chocolate.

Every two seconds, the surface area equal to one football pitch of rainforest disappears. It is estimated that 60–80 % off all timber extraction for the wood industry is illegal.

The average consumption of cotton per person in the USA, EU and Japan is ca. 11 kg (data as of the end of 2000). Cotton fields take up approx. 4 % of the world's farmland.

The production of a computer chip requires large amounts of water and 1,000 different chemicals (many of which are well-known toxins). Disposal of computer parts causes the creation of a mountain of toxic waste that pollutes the environment and endangers human health.



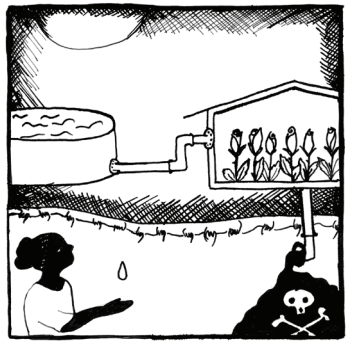
Rich countries use increasingly more single use sanitary products (kitchen towels, napkins, diapers) produced from cellulose.

Transporting flowers from a Kenyan or Ethiopian farm to a Czech florist's shop takes almost 5 days. Every third rose sold in Europe on Saint Valentine's Day comes from Kenya.

In 2000, mean annual consumption of cotton per person in Southeast Asia was roughly 1.8 kg. Up to 16 % of the global pesticides are used on cotton fields. Large quantities of toxic chemicals are used also in the further stages of cotton processing.

In 20 years, one European family produces approximately 900 kg of electronic waste whose greater part is illegally exported to China or West Africa due to cheaper processing costs and less severe laws.

Cellulose for the European market is acquired primarily from trees of the temperate zone. A smaller, but constantly growing proportion is imported to Europe from Brazil, for example. This cellulose originates from eucalyptus plantations. Although they are replanted, they were often established replacing the primeval forest. Eucalyptus plantation is moreover a form of forest characterized by a much lower species variety.



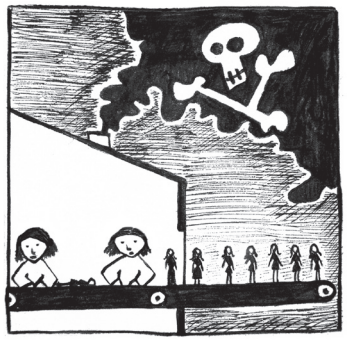
Annual production of 1 hectare of roses uses-up between 10 and 30 thousand litres of water. Each rose needs 1.5 litres of water a day. Farms overuse local drinking water resources and the treatment of blossoms by dangerous pesticides causes their severe pollution and the occurrence of various serious diseases among the workers.

Three Mattel Barbie dolls are sold every second. In 1995, the Executive Director's wage was more than the wages of all Mattel workers in China combined.

An average Czech person drinks 4 kg of coffee per year. Although around 20 million small farmers produce roughly 50 % of the world's coffee, coffee trade is controlled only by three big companies. The situation in coffee processing is similar – 5 multinationals (among them Nestlé and Kraft Foods) control 87 % of the European coffee market.

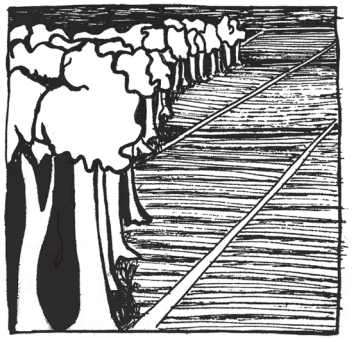
Mean annual meat consumption of inhabitants of the wealthy countries lies between 70 and 110 kg. The diet of consumers of meat products is incomparably more demanding than the diet of vegetarians or vegans, especially in terms of the surface required for the cultivation of foodstuffs and the energy input.

The same amount of energy is required for the production of one aluminium can as for watching eight football matches on TV (758 minutes). Production of one ton of aluminium results in the creation of 1.3–1.5 tons of toxic waste.

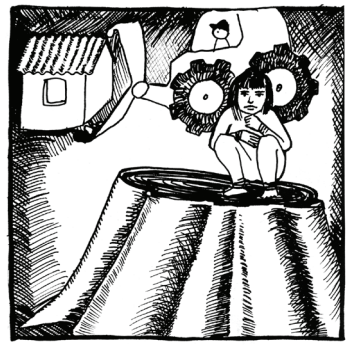


80 % of all toys sold worldwide are manufactured in China. A Chinese worker is paid only 12 cents for one Barbie (in Europe it is sold for roughly 15 euro).

From 1 euro that they charge you for a cup of coffee in a café the farmer receives 2 cents at most. A small farmer receives only between 2 and 8 % of the final price of a coffee pack. In 2002, an average small coffee farmer producing around 200 kg earned only 128 euro for an entire year!



European cattle presently consume soy feed cultivated on a surface 7 times larger than all farmland in Europe and 90 % of this soy originates in plantations occupying the land of cleared rainforests.

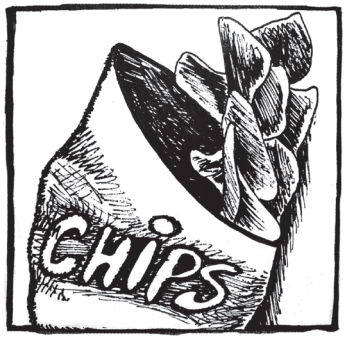


Due to the construction of dams and hydraulic power installations that supply energy chiefly to factories for producing aluminium for export, between 40 and 60 million local inhabitants all over the world have had to relocate.

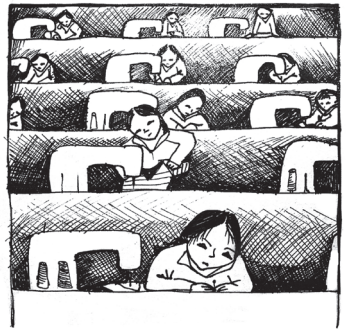
If we buy a T-shirt in a normal shop for CZK 250, up to CZK 200 from this amount is marketing costs and merchant margins.

Every year, millions of footballs are made to satisfy the European and American markets. Chief producer countries are Pakistan, India, China and Thailand.

Since 1990, the consumption of fuel in Europe grew by 72 %. At present, there are over 600 million cars in the world. If the present trend continues, in the 2030s the number of cars will double.



Palm oil is presently used for producing around 50 % of all consumer goods ranging from cosmetics and consumables to foodstuffs and bio fuel.



Women sewing clothes for famous brands are normally forced to work from 8am to 10pm, 7 days a week with 1 day off only once every 3 months. If we pay around CZK 250 for a T-shirt, the seamstress's wage amounts to only about CZK 2.50.

Production of footballs is associated with a number of severe violations of labour rights. Home production in small workshops is typical for this sector with workers receiving unbearably low wages (ca. CZK 6 for one football) and being constantly threatened with the risk of losing their job. In recent years, the occurrence of child labour was curtailed but other issues are escaping the public eye.

Huge drill-ships extracting oil from the depths of the seas are constantly at work to satisfy the world's dependence on oil. The actual operation and numerous explosions of oil rigs disastrously pollute the seas and oceans by oil spills that destroy all life.

In Indonesia, the area of rainforest equal to one third of the Czech territory has been cleared just to make space for the production of palm oil for the Western market. The deforested areas have been replaced by large palm plantations that cause soil degradation, wind erosion and environmental pollution due to pesticide spraying.

Attachment 2

What do we already know?	
What surprised us most?	
What do we distrust?	
What does not really concern us?	
Which of the issues in question do we consider as the most serious?	
What would we like to know more about?	

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TRAVELLING BANKNOTE

Goals:	Students explore the length and width of monetary flows. Students examine the side-effects of purchasing decisions, e.g. the impact that we have beyond merely the producer. Look for similarities and common points.
Curriculum links:	Social Studies, Economics
Age:	13+
Time:	45 minutes
Materials:	sheets of paper and coloured pens

Procedure

EVOCATION / 15 min.

- Ask the students to make a circle and give each one a piece of paper. Ask them to think of the last important thing that they bought. Encourage them not to think of something ordinary, but of something that really means something to them. It could be anything from tickets to a concert, a book, an iPad. Ask them to draw that thing in the centre of the paper. Then they make a short presentation why they chose that particular thing, why they consider it important, what it means to them. They can share it in smaller groups.
- After the round of presentations, ask the students to think about where they got the money to buy the thing. *Was it pocket money, scholarship from the state, maybe they earned it through work…?* Whatever their source may be, ask them to try and trace it as far as they can. For instance, if they got the money from their parents, they should think about where their parents are working, where the company that they work for get their money from etc. Encourage them to try to imagine it as far as they can.
- Ask them to draw the sources of money on the left side of the paper and make the links to the object in the centre similar to in a mind map. Discuss the results in the circle.

REALIZATION OF MEANING / 20 min.

- After that, ask them to try to imagine where their money would go, now that they have bought the thing. *Who will benefit from it?* Again ask them to try to imagine it as far as they can and to try to be creative in their work and think of wildest connections possible.

  For instance, a person bought a new pair shoes. The money would go the owner of the shop, to the person who made the shoes, to the people in advertising etc. The owner of the shop pays the employees. The employee buys bread, so his money goes to the baker, the baker needs to buy flour, so his money goes to the farmer that grows wheat. The farmer has a child, who is ill, so his money goes to pay the doctor; the doctor goes to a concert and pays money to the musician…. etc. Ask them to try to imagine as many diverse professions as possible in their charts. (This serves a special purpose in the last stage)
- Discuss the results:
  - *How many people are involved in your diagrams?*
  - *Is the thing that is in the centre of the paper also important for those people?*
  - *How close do they have to be to see a direct effect on their lives? For instance – is it just the last stage of production? What about the suppliers to a factory? How about the people who sell food or rent flats to the people who made their chosen object? Is there an end to these connections?*
  - *How would the people on the diagram perceive those connections? Would they know or care about them?*
  - *How about us? How many of these connections do we recognize and how many are hidden?*
  - *Was it difficult for you to draw the diagrams?*
  - *Are your pictures coming from your knowledge? Did you know that you had such knowledge?*

Action:

- After they complete this stage, look for possible connections or similarities between the pictures. For instance, let's say that someone drew a pictureof a pair of shoes – and maybe someone's parents work in a shoe factory or something like that. Or maybe we can see that if you spend the money on let's say a book or a piece of jewellery it finds its way into the hands of the same people.

REFLECTION / 10 min.

- For closure ask the students to stick the diagrams on the wall or put them on the display on the floor. Ask them to take a colour pen and try to imagine their future profession (workers, teachers, clerks, artists...). If possible make sure that each student gets a pen of a different colour. Ask them to go around the diagrams and circle their profession on each diagram where they can find it.
- The purpose of this exercise is to demonstrate that not only do we affect other people by buying their products or consuming their services, but also our lives are affected by the same people in a vice-versa manner.
- Discuss the results:
  - *Was everybody able to find their place in one of the diagrams?*
  - *Can you imagine that you could find yourselves in there – as producers or providers of service?*
  - *What does all this interconnectedness mean?*
  - *Who relies on whom for survival?*

  Tell them that an average European earns about € 500.000 during their lifetime. *Do you think this a lot? Did you imagine that you had such purchasing power? What can all that money do? What does it mean for us?*

WHO DO THE RAINFORESTS BELONG TO?

Goals:	Students are able to identify possible causes of rainforest deforestation. Students develop the ability to understand the connection between our everyday consumption and rainforest deforestation.
Curriculum links:	Geography, Biology
Age:	12+
Time:	45 minutes
Number of students:	8+
Space:	a classroom with sufficient amount of space in the middle, gym, school yard
Materials:	3 sets of pictures *(Attachment 1)* 3 big sheets of paper pens, coloured pencils 26 sheets of A4 paper with letters of the alphabet – one letter on each sheet video document about rainforest deforestation caused by palm tree oil production and its uses in cosmetics (Greenpeace)
Preparation:	Prepare 26 sheets of A4 paper and write a letter of the alphabet on each one of them.

Procedure

EVOCATION / 15 min.

- Tell the students that you will be talking about rainforests. Give a pen or a coloured pencil to each student. Put the sheets of paper with letters of the alphabet on the floor. Explain to the students that you will be asking them some questions and their task will be to stand next to the sheet of paper which has an initial letter corresponding to the student's answer.
  (e.g. If the answer is a parrot, they should stand next to the sheet of paper with the letter P).
- When everybody is standing next to their sheet of paper, tell the students to say the answer aloud. Ask them to draw their answer on the paper with the relevant letter.
- If you have more time for this activity you can set a rule that if somebody's answer is the same as someone else's, the student has to think of a new answer and move themselves to another letter. Using this approach, the students are encouraged to think about the question more deeply.
- Ask the students the following questions:
  - *What can you find in a rainforest?*
  - *Why are rainforests important?*
  - *Name one thing in your home, school or region which probably comes from a rainforest.*
- In the end you should have a series of colourful pictures of rainforests on the floor. Collect the papers and put aside those with the most pictures on them. You will need them for the final assessment.

REALIZATION OF MEANING / 20 min.

- Divide the students into 3 groups. Give each of the groups one set of photos (The *Attachment 1* contains Set 1, Set 2 and Set 3). Tell them they have approximately 10 minutes to think of a story that would contain all 5 photos from a given set. Encourage them to be creative and let them explore their imagination as there is no right or wrong interpretation.
- When their stories are ready, each group presents their story to the rest of the class.
- After all 3 groups have presented their stories, join all the groups and encourage them to come up with a suggestion about how these pictures relate to each other. Ask them to think about possible connections and give them little clues and necessary information if they are not able to find any. Play a short video document from Greenpeace about rainforest deforestation. You can then stimulate a discussion on the given problems.

- After the discussion ask the students to return to the photos and to try to reconnect them into different stories on the basis of the information they gained.
- Referring to the student´s impressions and thoughts, ask them in the end:
  What can we – as ordinary consumers – do to stop the negative impact on world rainforests? What will you change next time you go grocery shopping?

  Note: See more information about deforestation in the Infobox on the page of the next activity.

Attachment 1 – preview

Set 1

source: Greenpeace ©

Blue-and-yellow parrot (Ara ararauna), Brazil

source: Greenpeace ©

Children on the beach, Tarawa

source: Greenpeace ©

A rainforest in Indonesia

source: Greenpeace ©

Girls in an Indonesian rainforest

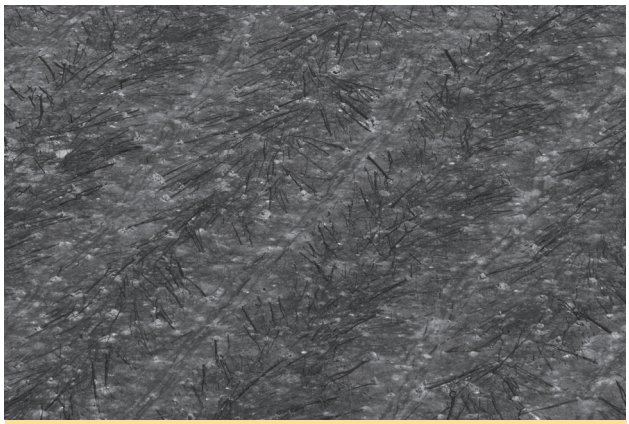
source: Greenpeace ©

A boy from the village of Rio Negro, Amazonia

Set 2

source: Greenpeace ©

Critical drought in the Brazilian Amazonia, Manaquiri Lake, 150 kms from the capital city of Manaus



source: Greenpeace ©

Peat Land Rainforest in Riau Province, Sumatra

source: Greenpeace ©

An Amazon rainforest on fire

source: Greenpeace ©

Pará Expedícia, Amazonia, a man walking in the remnants of a forest damaged by fire

source: Greenpeace ©

Burnt trees in Amazonia

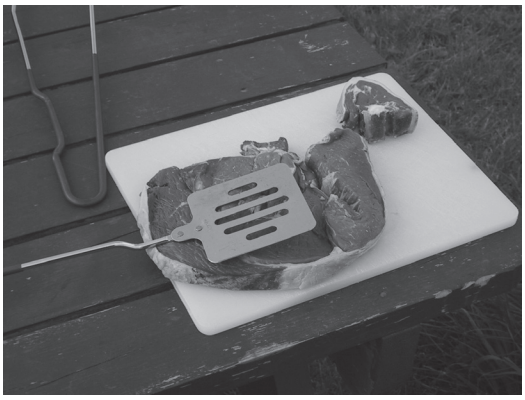
Set 3

source: www.sxc.hu

source: www.sxc.hu

source: www.sxc.hu

source: www.sxc.hu



source: www.sxc.hu

DEFORESTATION IN OUR HANDS

INSPIRED BY THE MANUAL "THE TASTE OF RAINFOREST" BY NAZEMI

Goals:	Students analyze the global connections between the diminishing of rainforests and our consumer behaviour. Students can read maps and remember information presented in areport about the diminishing of rainforests that they will listen to. Students evaluate the importance rainforests have in the world.
Curriculum links:	Geography, Biology
Age:	12–19
Time:	45 minutes
Number of students:	2+
Materials:	quiz *(Attachment 1)* cards with examples of various people *(Attachment 2)* post-it notes, world map at the end of the brochure beamer for students *(Attachment 3a, 3b, 3c)* computer Greenpeace film documentary Ancient forest destruction http://www.greenpeace.org/international/en/multimedia/videos/Ancient-forest-destruction-/

Procedure

- Give the students the quiz *(Attachment 1)* and ask them to fill it in. The estimated time for them to fill it in is 2 minutes.
- After they are done with the quiz, tell the students to put it aside saying that you will get back to it at the end of the lesson. Just ask them how easy or difficult the quiz was.
- Divide the students into 2 groups. Each group will get the same set of cards that describe various people *(Attachment 2)* and a world map. Each member of the group will take one card. In addition, give the students post-it notes of two colours (e.g. pink and green) that are cut into strips of 1-2 centimetres. Each strip will have one end that they can stick.
- Ask the students to first read to themselves the information about people and their situation that their cards describe. They should think whether the person has or has not any impact on the diminishing of rainforests.
- Subsequently, tell both the groups that their task is to place on the map, as quickly as possible, a post-it note with the name of the person on their card onto the country where this person comes from; they decide on the colour of the post-it note based on:
  - if they think that the person has some impact on the diminishing of rainforests, tell them to use a pink note with his/her name.
  - if they think that the person does not have any impact on the diminishing of rainforests, tell them to use a green note with his/her name.
- Remind the students that they only have 5 minutes for the task and that they need to carry it out in the fastest possible way. When they finish, place the maps of both groups in the centre and ask the students to make a circle around the maps. Then ask them to talk briefly about where they placed their card representing a certain person, and what they think about the person's relationship to rainforests. Both groups will have the chance to compare their results and to discuss them. If they decide they want to change anything, give them the opportunity to do so. However, everybody else in the group should agree with it.

- We recommend you keep up a certain pace – if the students cannot tell, based on the information on their card, which country the person comes from, there is no need for them to dwell upon it – you can help them. If all the connections are not obvious right away, the students will discover them throughout the lesson. If any other connections get revealed, you or the students can swap the green note for a pink one.
- After all 3 groups have presented their stories, join all the groups and encourage them to come up with a suggestion about how these pictures relate to each other. Ask them to think about possible connections and give them a few clues and necessary information if they are not able to find any. Play a short video documentary from Greenpeace about rainforest deforestation. You can then stimulate a discussion on the given problems.

Examples of scenarios:

The person's description	What impact does he/she have on the diminishing of rainforests?
Suparman Alatas, Easter Java (Indonesia), he is an indigenous person, the rainforest is his home.	He lives from hunting; he cuts just a small part of rainforest that he needs to provide subsistence for his family and himself.
Francesco di Reggio, Palermo (Italy), retired, he loves holding garden barbeques, grilling meat with his friends.	The meat comes from animals that are fed with plantation-grown soy feed.
Joost Nuijten, Haarlem (Holland), poet, he loves Belgian beer that is sold in cans.	Beer cans are made of aluminium/bauxite that can originate from deforested lands where there used to be rainforest.
Damien Ricketso (Australia), vegan, he eats soy products.	Soya can be grown on plantations created on deforested lands where there used to be rainforest.
Lenka Nemečková, Borinka pri Bratislave (Slovakia), retired; she has a deep-fat fryer and buys oil for frying.	If palm oil is used for deep-fat frying, such oil is made of oil palms grown on deforested rainforest lands.
Miguel Servía, Sevilla (Spain), rich, his furniture is made of tropical wood.	Tropical wood comes from rainforests.
Charlotte Diehl, Toronto (Canada), owns a small sweetshop in the city centre; her favourite dessert is chocolate cake.	The cocoa powder that she uses to make chocolate cake comes from plantations that were created on the ground where there used to be rainforests that were deforested.
Mauricio Freitas, Mato Grosso (Brazil), former fisherman, he got a job working on the building of a hydro electrical plant.	Building of the dam led to a large area of land being flooded; the hydro electric plant constructed there now provides energy to a factory that processes bauxite extracted in deforested lands where there used to be rainforest.
Bill S. Folding, Iowa City (Iowa in the USA), is a workoholic; he drinks six cups of coffee a day – he likes Ethiopian coffee.	The coffee can come from deforested lands where there used to be rainforest.
Uwe and Uschi Winter, Hamburg (Germany), likes to run their car on bio fuel.	Bio fuel is made of palm oil. Oil palms are grown on deforested lands where there used to be rainforest.
Ishikato Natushi, Kjóto (Japan), terminally ill with cancer for which there is no cure so far.	He is waiting for new medicine that will be made from plants whose habitats are rainforests.
Jiří Novák, Brno (the Czech Republic), he has his own business makings chips, crackers, roasted nuts and the likes.	Palm oil used in frying and roasting causes the diminishing of rainforests.
Olivia Freitas, Pará (Brazil), a widow, she has lived in a slum near Sao Paulo since her home in a rainforest was destroyed when the rainforest was felled.	She is a victim of logging companies which caused loss of her house.
Izak Ben Kannan, Tel Aviv (Israel), positioned in Brazil, he is in charge of supervising cattle slaughter so that it is done in a kosher way.	Beef comes from animals bred on deforested pastures where there used to be rainforests.
Farish Ahmad Noor, Kuala Lumpur (Malaysia), works on an oil palm plantation whose produce is aimed at export; he also has his own little field for subsistence.	The plantation was created through deforesting rainforests.

- After the students are done with this task, they will put aside their maps with post-it notes. It is better to put them somewhere where the post-it notes cannot get crumpled since the class will get back to them later.
- Having done the card activity with different roles, play a short video to the students. It is Greenpeace *Ancient forest destruction documentary*.
- Then, when the students have watched the film, ask them the following questions:
  - *What impression did this video make on you?*
  - *What do you think the main causes of rainforests deforestation are?*
  - *What are the main consequences of it?*
  - *What surprised you most?*
  - *What do you think we can do about it?*
- Ask the students to make pairs again. Each group will get 1 set of worksheets ***(Attachments 3a–c)***. Tell the students that you are going read them a report, you can also read it out to the students. Remind them to listen carefully since they will need the information from the report to know how to work with the worksheets.
- Tell the students that you are going to play the reports in parts. The students should first prepare ***(Attachment 3a)*** and read closely the instructions. Subsequently play or read out to them the first part of the report. Remind them once more to listen attentively since they will hear the information necessary for them to be able to fill in the worksheets. You can also advise them to select a person who will take down important information or who will directly note it down in the worksheets. They should just do it in such a way so that they don`t disturb the others and that they can listen to the whole report.

Report – Part 1

A weekend shopping in a shopping mall – one of the things that we do on a regular basis. Our decisions are, however, influenced both directly by other people around us as well as globally. Have you ever thought about how our consumption is connected to rainforests in the world and to what extent we are responsible for their deforestation? At the beginning of the 20th century tropical rainforests covered an area of about 16 million km^2, while nowadays it is less than half. Every two seconds an area the size of a football field disappears. The question is, then, what are the main causes of the destruction of these valuable ecosystems? In the Amazon rainforests 70% of deforestation is linked to clearing the land for pasturelands for cattle; 25% of previously forested land is cleared for both large-scale as well as smallholder crop farming. Although logging causes only 3% of the forested land loss, 75% of all the logging is illegal. In addition to these, other factors result in deforestation, such as extraction of mineral resources and construction of water reservoirs as energy sources, important mainly for the logging industry.

- After the students listen to the first part of the report, ask the groups to fill in ***(Attachment 3a)***. Allow 1 minute for this activity.
- After they finish, let the students listen to the next part of the report.

Due to vast deforestation of rainforests, we are losing the greatest natural treasure on the Earth before being even able to see its real value. Currently we are witnessing the biggest disappearance of species since the dinosaurs' extinction 65 millions years ago. Conservative estimates tell us that yearly 9 000 species have been lost, most of whose habitats are in rainforests. This does not refer to significant insect species and animals only, but also to plants used in the production of about a half of all the pharmaceuticals we use nowadays. It is more than likely that if pharmaceuticals to treat cancer and HIV were discovered, they would be made from rainforest plants. Destruction of these rich lands has an immense impact on the indigenous populations inhabiting the rainforests. As a result of 500-year violence, exploitation and diseases, the Amazon region has lost most of its indigenous inhabitants. Currently only around 500 thousand of the indigenous people, spread among about 500 tribes, have survived.
Are we, people who live thousands of kilometers away from the rainforests, able to have any impact on such destruction of rainforests? We can do plenty and we can do it right away! As consumers we can contribute to the reduction of deforestation of rainforests – by making choices about what we buy and what we do not, to the benefit of the rainforests. Think of, for instance, potato chips. Palm oil, which is used in their production, is one of the main factors responsible for the deforestation of rainforests. It is not chips only, however, which are to blame. Palm oil is used in almost 50% of production of various products, such as cosmetics, food or bio fuel. Another crop to mention is soy. Currently, 90% of soy grown on plantations where there used to be rainforests is used to produce animal feed. Cattle in Europe are fed with produce grown in an area 7 times bigger than the whole agricultural land of Europe. If every person on this planet consumed as much meat as an average person in Europe does, we would need agricultural land as big as 4 planets the size of the Earth. Another 10% of soy is used in food industry (as emulsifier or as other parts of foodstuffs) or in soy biodiesel industry.

- After the students listen to the second part of the report, ask the groups to fill in ***(Attachment 3b)***. Allow 2 minutes for this activity.

- After they finish, let the students listen to the last part of the report.

As it was said already, in the Amazon 70% of the rainforests are deforested with the objective of clearing the land for pastureland for cattle. You might think – this has nothing to do with me. Although the percentage of beef from South America that gets onto our market is small, we tend to forget about other products that are made of cattle. Where do you think the leather of your running shoes came from? The well-known company Nike created a challenge to other sportswear brand companies such as Timberland, Adidas and Reebok: Nike management decided not to support destruction of the Amazon rainforests: in its manufacturing it does not use leather made of cattle raised on deforested lands. Other products originating in the rainforests are furniture, floor coverings and other utility articles made of tropical wood such as mahogany, teak and other valuable wood logged in rainforests. It is big business, yielding huge profits. Unfortunately most of the profits from sales of the wood do not go to the developing countries; they go to multinational companies and business owners located in rich countries. Another problem arises, for instance, in the south of Brazil where eucalyptus is planted on the land where there used to be rainforest. Eucalyptus cellulose is exported more and more to Europe and the USA and it is more frequently used in paper tissues, napkins and such. Pulp, waste left after logging the original rainforest, is added into, for instance, photographic paper.
Another material that links us to rainforest destruction is the production of aluminium. Aluminium is an every-day part of our lives: it is in cans and tetra packs used for packing beverages; it can be found in vehicles and in things that we use on a daily basis. The chief source of aluminium is bauxite in which aluminium is contained in 3–5%. Bauxite is mainly extracted in tropical rainforests that have to be cut down in order to make space for the extraction. Additionally, bio fuels need to be mentioned. Bio fuel is an alternative type of fuel whose energy is derived from processing sugar cane and oil palm. Experts warn that since there is a constant rise in oil prices, this will be reflected in higher demand for bio fuel. And if we looked closely at the manufacturing of other products, we would be able to spot more and more connections. There are estimates that the last rainforest will be used up in fewer than 40 years. Unless we take strict measures and urgent action to stop destruction of these vital ecosystems, the consequences will be disastrous.

- After the students listen to the third part of the recording, ask them to fill in ***(Attachment 3c)***. Allow 3 minutes for this activity.
- After the students are done with filling in the last worksheet, go back to the individual sheets in the reverse order; that is starting with ***(Attachment 3c)***. Ask the student to share their answers with the whole class. Then tell them the possible answers. 5 minutes.

Here follow possible answers to the worksheet tasks that can be helpful to you in the lesson:

KEY TO Attachment 3c

Kleenex paper tissues	0–1	Their manufacturing makes use of pulp that is produced on eucalyptus plantations established in place of logged rainforests.
Chocolate snack bar Horalka	1	Although it is a small percentage of soy products that originate on deforested land, this snack bar does contain a small amount of soy emulsifier.
A can of 7up beverage	2	The can is made of aluminium which is made of bauxite. That is an ore extracted in rainforests. Deforesting more land to make space for bauxite extraction and steps to establish factories producing aluminium directly in the rainforests lead to extensive deforestations.
Garden furniture made of tropical wood	2	Despite various advantages that the use of tropical wood has, using it instead of local wood is an extremely unsound choice.
Bio fuels used in vehicles	2	Using palm oil or ethanol produced from sugar cane does not cut down on CO^2 emissions in the least. In addition to this, it is responsible for the logging of rainforests, which leads to further CO^2 releases. And this is not considering the fact that the boom of bio fuels leads to rises in food prices.
Dove cosmetics	1–2	Apart from other substances, it also contains palm oil, which is produced form oil palms grown on deforested lands. Oil palm plantations are currently one of the major factors responsible for the deforestation of rainforests.
Nike leather running shoes	0	Nike recently announced that for its manufacturing it was not going to use leather acquired from cattle raised on farms that were created on deforested land in the Amazon region.
Beef	1–2	Cattle raised for this meat is most likely fed with animal feed produced from rainforest soy.
Organic shampoo not containing palm oil	0	It does not contain palm oil acquired from palms grown on plantations, which is otherwise a substance commonly used in cosmetics; in addition organic shampoo contains natural materials only.

KEY TO Attachment 3b

A solution:
"One of the causes of the disaster is deforestation carried out by thieves, but we don't know who they are."
Hadi Supeno

1.						**D**	I	N	O	S	A	U	R	S		
2.					Y	**E**	A	R	L	Y						
3.			H	A	L	**F**										
4.			E	U	R	**O**	P	E								
5.			P	H	A	**R**	M	A	C	E	U	T	I	C	A	L	S
6.					F	**E**	E	D								
7.			C	O	N	**S**	U	M	P	T	I	O	N			
8.	B	A	U	X	I	**T**	E									
9.					P	**A**	L	M		O	I	L				
10.						**T**	R	I	B	E	S					
11.				B	I	**I**	O	F	U	E	L	S				
12.					S	**O**	Y									
13.			R	A	I	**N**	F	O	R	E	S	T	S			

1. Currently we are witnessing the biggest disappearance of species since the **dinosaurs** extinction 65 millions years ago.
2. Based on estimates, what is the time span in which 9 000 species disappear, most of whose habitats are rainforests? **Yearly.**
3. What is the share of the total volume of products commonly available in supermarkets for whose production palm oil is used? **Half**.
4. If every person on this planet consumed as much meat as an average person in **Europe** does, we would need agricultural land as big as 4 planets the size of Earth.
5. Current medical treatments benefit from rainforests. Medical researchers make **pharmaceuticals** from rainforests' biological richness.
6. What is 90 % of soy grown on deforested lands turned into plantations used for? Animal **feed**.
7. What do we need to cut down on as Europeans to make sure that the deforestation of rainforests is slowed down? **Consumption**.
8. What is the ore that aluminium is made from and whose extraction is also responsible for felling rainforests? **Bauxite**.
9. What ingredient acquired from a crop grown on deforested lands turned into plantations is used to make potato chips? **Palm oil**.
10. What are the social groups called in which indigenous people in rainforests live? **Tribes**.
11. What is the alternative source of energy used to power cars that is made of sugar cane or palm oil and, therefore, also responsible for the diminishing of rainforests? **Bio fuels**.
12. What is the other main crop that is responsible for mass deforestations? **Soy**.
13. Where do most plants used to make almost half of the pharmaceuticals that we use on a daily basis come from? From **rainforests**.

KEY TO Attachment 3a
Fill in the gaps with numbers or words.

At the beginning of the 20th century tropical rainforests covered the area of approximately 16 million km^2; nowadays the area is less than half.
It is estimated that every 2 seconds the area that is cleared of rainforests equals the size of one football field.
In the Amazon rainforests in Brazil illegal logging amounts to 75 % of the total logging volume.

Fill in the graph with the factors that are responsible for deforestation of rainforests in the Amazon based on percentages.

70% Pasturelands to raise cattle
25% Large and small-holder farming
2% Extraction of mineral materials; construction of dams
3% Logging

- Ask the students to go back to the answers of the quiz and encourage them to share some of their answers. Subsequently, together go over the answers that are correct according to experts:
  1c 2a 3c 4d 5b 6b 7a 8a 9b 10c 11b 12a 13b 14c.
- Now ask the students to go back to the maps with post-it notes and cards representing models of certain people. Having all the information now, would they want to change anything? Repeat to them once more:
  - *if they think that the person **has** any impact on the diminishing of rainforests, tell them to put a **pink** note there with his/her name.*
  - *if they think that the person **does not have** any impact on the diminishing of rainforests, tell them to put a **green** note there with his/her name.*
- Here are some examples in case the students get stuck and not know how to continue:
  First and foremost we can read what the products contain and what they were made of. We can, then, aim at reducing consumption of products originating in rainforests, or we can stop buying these products altogether. Furthermore, we can reduce our meat consumption, buy organic meat or meat processed from animals raised in smallholding farms or fed with animal feed other than that produced by soy plantations. Also, we can avoid buying stationery articles containing 100% cellulose coming from logged wood. Another option is to only shop for products made from FSC tropical wood, which provides the consumer with a guarantee that they do not support illegal logging and environmentally-harmful processes and bad ecological and social conditions with their money. (Make sure that the students are familiar with the FSC certification system. This is not the case, the lesson might not give enough space for you to discuss it. If you have no time to go into detail about it, stick to just talking about locally grown trees, i.e. in Central Europe).
  Also, these days consumers are getting more familiar with Fair Trade products that guarantee that the crops that they were made from were not grown on deforested lands but instead in an environmentally-friendly way. Apart from this, these products also guarantee that their production enabled the producers and their children to have good working and social conditions. Within the Fair Trade system, it is possible to buy coffee, cocoa powder, chocolate, tea, spices, crafts, and to a lesser extent dried fruit, clothes etc. The students can even help through educating others: they can organize a lecture followed with a discussion; they can also prepare a similar activity for other students in their school; they can also join a campaign for saving rainforests (this issue is mostly taken up by Greenpeace).

Infobox

Tropical rainforests cover approximately 2% of the Earth's total surface area (i.e. approximately 7% of the Earth's dry land surface). However, they are home to 50% of all animal and plant species. The tropical rainforest is the richest type of forest in terms of species diversity. One hectare can be a habitat to 40 – 90 types of trees, while one single tree can be home to over 40 ant species. The largest rainforests are found in Brazil, The Democratic Republic of Congo, Indonesia, Peru and Colombia. Every forest is of crucial importance for the stabilization of the water cycle and climate conditions. Rainforests do not supply the Earth with oxygen directly, they, however, absorb a lot of CO^2, which contributes to maintaining a stable climate. If due to deforestation CO^2 is released, it means a significant contribution towards the worsening of the greenhouse effect. The so called small water cycle above rainforests is responsible for huge concentrations of water vapour. It is very likely that deforestation in these areas is responsible for more frequent occurrences of extreme floods both in countries that are more distant as well as in Europe. Soil in rainforests is very poor, as nutrients are bound-up in the quickly growing living biomass.

Our planet still provides living habitats for numerous cultures in which a bond with the rainforest is completely natural – these are, among others, Pygmy peoples (Africa), the Penan (Borneo), various groups in South America and others. These indigenous groups view the rainforest as their Mother who cannot be owned or sold.

The diminishing rainforest

In the last 300 years we have felled trees from half of the total area of rainforests. At the beginning of the 20th century tropical rainforests covered an area of approximately 16 million km^2 while nowadays the area still covered with rainforests is less than half of this (approx. 7 million km^2). Every two seconds an area of rainforest as big as a football field is gone. If deforestation continues at its current rate, rainforests outside delineated reservations will not survive to the second half of the 21st century.

Consumer responsibility: how our broken relationship with rainforests can be fixed.

Coffee, chocolate, and bananas – the problem with many pleasurable foodstuffs grown in the areas of tropical rainforests also lies in irresponsible purchase prices. If the free market leads to the plummeting of prices, it will be farmers in developing countries who will be affected. The inability to make a living on land results in child labour, exodus to urban slums, taking up drug cultivation instead of crops, and attempts to ensure better income through increasing production by extending plantations at the expense of the rainforest.

Aluminium – Europe has no significant deposits of bauxite, which is the material that aluminium is made from. Its deposits are found predominantly in equatorial areas. Some of the most crucial suppliers of bauxite are Brazil and Jamaica where bauxite extraction is responsible for the destruction of vast areas of tropical rainforests, causing irreversible damage and displacement of more than 20 000 indigenous people who lose everything – homes, opportunities to make a living, rivers that were fundamental to their survival.

Hydroelectric power plants – one of the reasons for the construction of hydro power plants is to ensure water supplies for irrigation (however only big business companies have the financial means to take advantage of these resources since only they can invest in such complex technologies). Another reason for the construction of big hydro power plants is to ensure sufficient energy supplies for industries. In the Amazon basin, which is rich in mineral sources, it is the extraction industry. For example the company Alco, a world giant in aluminium production, has been making efforts to push through a project in Belo Monte since this area is rich in bauxite deposits. Aluminium is the world's second most used metal after steel. It is sought after for its light weight and corrosion-resistance. Its consumption worldwide has constantly been rising. It is used in automobile manufacturing, ship and aircraft manufacturing as well as in construction. To construct one automobile requires about 130 kilograms of aluminium. However, this also produces 6.500 kilograms of waste. Subsequently, when turning bauxite into aluminium toxic substances, such as fluorine, are produced that are released into the air damaging the environment. Aluminium production is energy-demanding. Already back in the 1990s energy consumption of the world's leading aluminium manufacturers was higher than that of all African countries altogether.

However, the local people, ironically, only minimally benefit from these giant projects. This is also the case of the hydro power plant in Belo Monte: out of its 11.182 MW output only 1.00 MW was used for the country's needs. The way of life of the indigenous populations is, for both cultural and simply practical reasons, very much tied to a particular territory in which they have been living for centuries. For example, the people of the Enauene group are dependant on fishing; they do not even consume any other meat. If a dam is constructed in the way of a natural water way, river fish completely die out in such an environment, which leads to a complete change in the local food chain. And in addition to this, a large area of still water has impact on the local climate. A dam floods the habitats of thousands of animals as well sacred places of the indigenous tribes that have been inhabiting the places. Even aluminium covers that we use on a daily-basis might have originated in the bedrock of a rainforest. Europe, having small deposits of this material, very much depends on the importation of it. The Czech Republic, though, recycles only a small percentage of its aluminium consumption. And this is despite the fact that aluminium has properties ideal for recycling. As opposed to producing it from raw material, recycling aluminium waste is energetically much less demanding: it saves about 97% energy.

Soy – soy plantations are the biggest threat to the Amazon rainforests. A vast majority of this crop does not get consumed in the area; it is exported predominantly to rich countries, mainly to the USA and to Europe. There, however, it is not consumed only by vegetarians who use it as a substitute for meat products; 90% of soy is used as animal feed that is fed to the cattle that eventually end up on our grills and plates.

Garden furniture – importation of wood from tropical trees to the Czech Republic is growing. Most frequently it can be seen in shops with garden furniture. Over a half of the trees used for the furniture were felled and exported illegally – poor countries thus lose not only a part of their natural richness but also the profits that they should enjoy.

Palm oil – if you look closely at a bag of chips, wrappers of cheap chocolate bars or instant noodles, you will find out that they more and more often contain palm oil. Producers of these products are excited about palm oil for its qualities (e. g. food does not stick to the pan) and its low price. Oil palm plantations are, however, the biggest threat to rainforests in the South-East Asia. Importation of palm oil to the Czech Republic is rising. It is widely used also in cosmetics and potentially as a bio fuel as well. For many poor countries a rainforest seems to be a hopeful resource and a way how to get out of a long-term poverty – especially since their hopes are encouraged by demand coming from rich countries. Indonesia is the world's second biggest producer of palm oil after Malaysia. However, palm oil plantations are one of the main reasons for the diminishing of the rainforests.

Countries of the global north (the USA, Australia, the EU countries, Canada, Japan and others), usually former colonial powers, are economically the richest countries in the world. Their demographic parameters are stabilized, they have a big impact on the rules governing the international trade, they provide initial capital, management and they take the majority of profits.

Countries of the global south (most of countries in Central and South America, Africa, South and South-East Asia) are usually former colonies or dependent territories. They often find themselves in extreme poverty; Unsustainable population growth and high child mortality rates are typical. They have to follow the international trade rules and requirements imposed by the World Bank, IMF or other similar institutions. They bear the majority of the costs (damage to the environment, mistreatments of workers, etc.); they provide a cheap labour force.

Social responsibility

For example, in the Amazon basin there is wide-spread and organized resistance against destruction of the environment of the indigenous populations. These efforts, supported by numerous NGOs, come directly from the local people. Destruction of rainforests can be slowed down by effective legislation, for example, by declaring certain areas to be natural conservation areas that have to be protected. The problem is, however, that for the poor countries the profits that are made, despite unequal trade conditions, off the rainforests, only bring short-term benefits. At an international level, though, a special fund is still being considered. Rich countries would contribute to it and poor countries could utilize it. It would serve as a certain type of compensation mechanism providing poor countries with compensation for protecting rainforests instead of turning them into goods for the international market.

Usage of aluminium can also be completely cut out in many cases or its consumption can at least be effectively reduced by conscientious recycling. This would also cut down remarkably on the consumption of energy needed for processing natural materials.

Palm oil to which foods do not stick and burn might be healthier for us, the consumers, but it is certainly not more favourable for ecosystems and people living in South-East Asia. (The healthiest chips are possibly those that we do not buy).

Consumer alternatives

Surprisingly, one can have a lot to do with a tropical rainforest as a consumer, although the connection can often be indirect. Whether a product we buy has something to do with tropical regions reflects what "relationship we have to rainforests". This relationship, or better said, the impacts of such a relationship can be improved by following these guidelines:

- If we choose agricultural products originating in the Czech Republic or in other European countries. In the case of crops that are not grown here, we will go for their Fair Trade alternatives (e. g. coffee, cocoa powder, bananas).
- When shopping for meat products, if we choose to buy meat that we know does not come from animals fed with soy from tropical countries (organic food, white water fish, etc.), or if we limit our meat consumption altogether.
- If we limit our consumption of palm oil (here the problem might be with providing sufficient information on products' labels). Then, if we consider using bio fuels, we should make sure these are not be made from crops grown on deforested land.
- If we limit our consumption of products made from mineral materials, mainly those that were most likely extracted in tropical rainforests, as is the case with aluminium. This also means using packaging that does not contain aluminium, or possibly from which aluminium can be separated and recycled (this is not the case, though, of tetra-packs).
- If we avoid buying products made from tropical rainforest wood. And if we do need to buy them, we should make sure they carry **FSC certification**. Forest Stewardship Council is a non-profit organization that guarantees consumers that their money was not used to support illegal logging and damaging industries. FSC products are guaranteed to have been made in environmentally and socially responsible conditions.
- If we prefer to buy **Fair Trade products** – Fair Trade guarantees the consumer that the products were not made from crops grown on deforested lands, and that the smallholder producers will get just prices for their produce, sufficient so that can make a living off it and will not have to move to slums, grow drugs or that they will be forced to employ child labour or deforest more land to extend their agricultural land. The social conditions of these producers are also important: fixed working hours, safety, work without forced child labour etc., as are ecological conditions: agriculture without using harmful pesticides and herbicides. Within the Fair Trade system it is possible to buy coffee that was not grown on plantations but in the shade of tropical trees. Currently these are the Fair Trade products available in the Czech Republic: coffee, chocolate, spices, crafts, to a lesser extent dried fruit, clothes, etc.
- If we buy products made of local FSC wood
- If we do not buy paper products that were manufactured using cellulose from tropical wood.

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Attachment 1

QUIZ

Question 1
How many species are becoming extinct every day in the entire world's rainforests?
A: 1
B: 12
C: 35

Question 2
Rainforests are full of life; how many species can be found per 1km^2?
A: 1000
B: 2000
C: 3000

Question 3
Rainforests have been here for ages, some of them as old as:
A: Bratislava Castle
B: Roman soldiers
C: Dinosaurs

Question 4
Rainforest plants have been helping us cure:
A: Leukemia
B: Lung cancer
C: Asthma
D: All of these

Question 5
What are the highest levels that some rainforests trees reach?
A: 25 metres
B: 45 metres
C: 65 metres

Question 6
What does it mean that a certain product was produced within the Fair Trade system?
A: Producers of these products will get a just price for them.
B: Crops for these products were not grown on deforested land, that means that were grown in ecologically and socially responsible ways towards the countryside as well as the producers and their children
C: These products are of high quality but at the same time they cost less than regular products so that even the poor could afford to buy them.

Question 7
How much area was covered by rainforests at the beginning of the 20th century and how large is the area nowadays?
A: The beginning of the 20the century: 16 million km^2 / nowadays: 7 million km^2
B: The beginning of the 20the century: 16 million km^2 / nowadays: 21 million km^2
C: The beginning of the 20the century: 5 million km^2 / nowadays: 3 million km^2

Question 8
What percentage of the total volume of rivers in the worlds pertains to the Amazon River?
A: 20 percent
B: 2 percent
C: 10 percent

Question 9
In the Amazon basin there are currently:
A: around 5000 indigenous groups
B: around 500 indigenous groups
C: around 100 indigenous groups

Question 10
Deforestation of rainforests to turn the land into plantations has been increased in intensity predominantly in order to grow:
A: kiwi and avocados
B: bananas and oranges
C: soy and oil palms

Question 11
What is one of the main factors responsible for mass deforestation of the world's rainforests?
A: Indigenous populations need land in order to make a living
B: Excessive consumption of the so called developed countries
C: The population in the developing countries is growing too quickly and people there do not have enough living space

Question 12
Every year the area of rainforest that is cleared equals:
A: about a half of Slovakia
B: London
C: 100 football fields

Question 13
The world's rainforests used to cover 14 % of the Earth's surface; currently they cover:
A: 6%
B: 2%
C: 10 %

Attachment 2

CARDS WITH REPRESENTATIONS OF VARIOUS PEOPLE AND THEIR DESCRIPTIONS

Suparman Alatas, Easter Java
He has lived all his life deep in a rainforest; he is a member of an indigenous group. Now, however, there is a looming threat that the indigenous people will have to move out since the area that traditionally belonged to this group is to be flooded due to dam construction.

Kikki Mansa, Ivory Coast
She has a small farm growing cocoa beans. The purchase price of the cocoa beans is very low as a result of which she and her whole family must work even harder. Also, for this reason, next year they are going to cut down a part of the rainforest so that they all will have more land to grow the cocoa beans.

Francesco di Reggio, Palermo
Retired, he went to spend his retirement in the country. He loves holding barbecues grilling meat in his garden with his friends.

Joost Nuijten, Háárlem
He is a poet. He likes wandering along the coast carrying some food and a can of Belgian beer.

Mikhail Petrovic Valinski, Irkutsk
He is a vegan who refuses at any cost to cause animal suffering. For this reason he is very happy that more and more often the Russian market has on offer alternative foods; and not only soy "fake" meat, but also soy yogurts and even soy fat.

Lenka Nemečková, Borinka pri Bratislave
She is retired; we do not know much detailed information about her except for the fact that for Christmas her grandchildren gave her a deep-fat fryer and she is just looking for where to buy good oil suitable for deep-fat frying.

Miguel Servía, Sevilla
He has just bought new garden furniture for his cottage. He likes it a lot and he is very happy about it. Tropical wood that does not show annual rings has a very good look and, on top of that, he will not have to take care of its surface.

Charlotte Diehl, Toronto
She is an owner of a sweets shop in the city centre. By far the most popular cake with the customers is chocolate cake.

Mauricio Freitas, Mato Grosso
He used to be a fisherman. However, he got a job at the construction site of a hydroelectric power plant, which is to provide energy supplies to a factory processing bauxite. He could not make a living off fishing any longer, since a dam built on the river where he fished led to the death of a lot of fish.

Bill S. Folding, Iowa City
He is a workaholic drinking at least six cups of coffee a day. For this reason he is a big connoisseur of coffee; his favourite one is Ethiopian coffee.

Uwe and Uschi Winter, Hamburg
They like to travel by car; they have learnt about the phenomenon of bio fuels and had their family car running on petrol turned into one running on bio gas. They do not use petrol any more.

Ishikato Natushi, Kyoto
She suffers from an incurable type of cancer. Doctors keep saying she should not give up hope since there is intensive research going on which will certainly yield some cure to her illness.

Olivia Freitas, Pará
She is a widow trying hard to get used to living in a slum near Sao Paulo where she had to move after the rainforest around her home was cut down and she lost her livelihood as a result.

Izak Ben Kannan, Tel Aviv
Currently he is on a business trip in Brazil where he supervises cattle slaughtering to make sure the meat is processed in a kosher way and can be distributed in Israel.

Farish Ahmad Noor, Kuala Lumpur
He works on an oil palm plantation where export crops are grown. Besides, he has his own little field where he grows foodstuffs for his own subsistence.

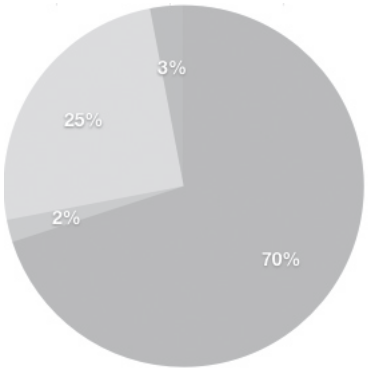
Fill in the gaps with missing numbers or words.

At the beginning of the 20th century rainforests covered an area of about 16 million km². Today the area is less than ……..

It is estimated that every 2 seconds rainforest of the size of……. disappears.

In Brazilian rainforests in the Amazon basin on average ……. % of logging is illegal.

Fill in the graph demonstrating causes of deforestation of the Amazon rainforests in terms of percentage out of the total.



Fill in the gaps with missing numbers or words.

At the beginning of the 20th century rainforests covered an area of about 16 million km². Today the area is less than ……..

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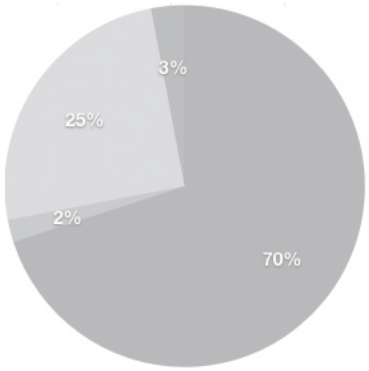
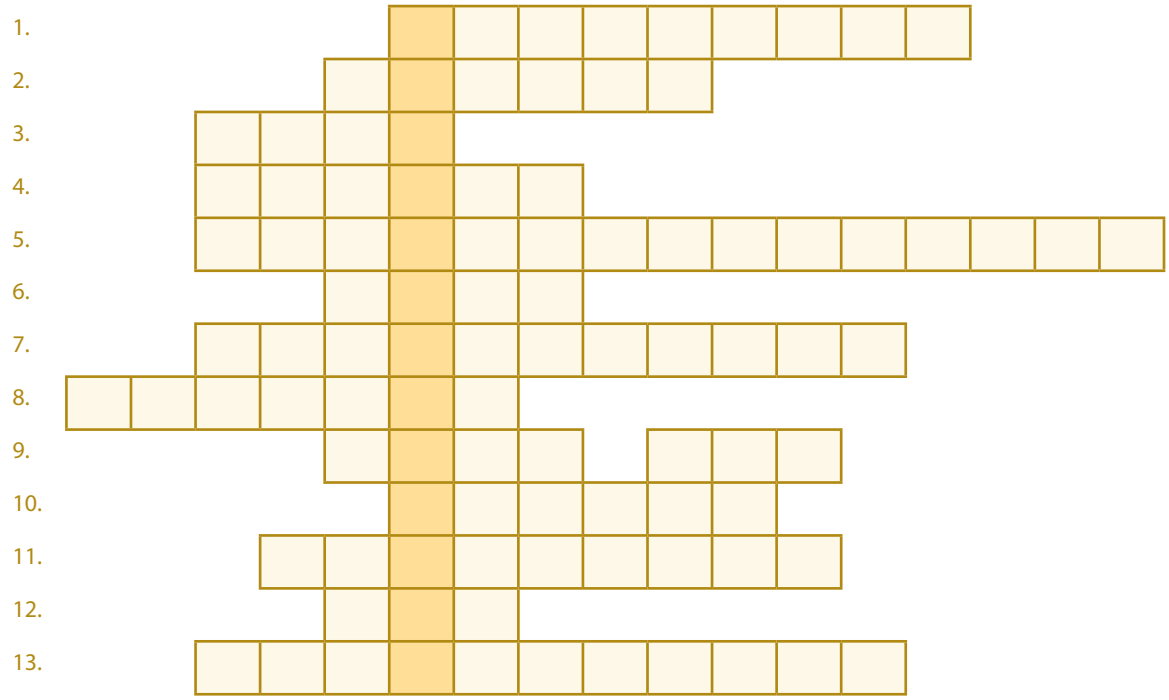
Fill in the graph demonstrating causes of deforestation of the Amazon rainforests in terms of percentage out of the total.



Attachment 3b



1. Currently we are witnessing the biggest disappearance of species since the ..... extinction 65 millions years ago.
2. Based on estimates, what is the time span in which 9 000 species disappear, most of whose habitats are rainforests? .....
3. What is the share of the total volume of products commonly available in supermarkets for whose production palm oil is used? .....
4. If every person on this planet consumed as much meat as an average person in .....does, we would need agricultural land as big as 4 planets the size of Earth.
5. Current medical treatments benefit from rainforests. Medical researchers make .....from rainforests' biological richness.
6. What is 90% of soy grown on deforested lands turned into plantations used for? Animal .....
7. What do we need to cut down on as Europeans to make sure that the deforestation of rainforests is slowed down? .....
8. What is the ore that aluminium is made of and whose extraction is also responsible for felling rainforests? .....
9. What ingredient acquired from a crop grown on deforested lands turned into plantations is used to make potato chips? .....
10. What are the social groups called in which indigenous people in rainforests live? .....
11. What is the alternative source of energy used to power cars that is made of sugar cane or palm oil and, therefore, also responsible for the diminishing of rainforests? .....
12. What is the other main crop that causes mass deforestations? .....
13. Where do most plants used to make almost half of the pharmaceuticals that we use on a daily basis come from? From .....

Attachment 3c

Here is a table depicting various products easily available around us. Do you think that production of any of them has any connection with the deforestation of rainforests? Are there other alternatives that would not cause the diminishing of rainforests? The first column presents various products. Your task is to evaluate the product on a scale of 0 – 2, which you will place into the second column, based on how much you think a given product is responsible for the diminishing of rainforests. In the third column you will write in brief the reasons behind the number you decided on.

The scale:
0 = means the product has no impact on the diminishing of rainforests
1 = means that production of some parts of the product has some impact on the diminishing of rainforests
2 = means that production of some parts of the product is largely responsible for the diminishing of rainforests

Table: The impact on deforestation of rainforests

Potato chips Slovakia	2	They contain palm oil whose production is one of the biggest factors responsible for deforestation of rainforests.
Regular coffee	1	Coffee whose purchase price is undervalued on the international markets forces coffee growers to expand their fields at the expense of rainforests.
Fair Trade chocolate	0	One of the Fair Trade system's pillars is that producers cannot continue expanding their fields at the expense of rainforests. The price that they get for their coffee is sufficient so that they are able to make a living off their existing land.
Kleenex paper tissues		
Chocolate snack bar Horalka		
A can of 7up beverage		
Garden furniture made of tropical wood		
Bio fuels used in vehicles		
Dove cosmetics		
Nike leather running shoes		
Beef		
Organic shampoo not containing palm oil		

WATER AND GLOBAL TRADE

Goals:	Students will visually grasp the concept of virtual water, as well as our usage of water which comes from other countries. Students will analyse the dynamics of world trade.
Curriculum links:	Geography, Social Studies, Economics
Age:	14+
Time:	45 minutes
Number of students:	15–30
Space:	the game requires an empty space (a classroom with the desks moved to the side), a school yard etc.
Materials:	thin strings or ropes – each of them tied into a circle big enough for one person to stand in (one for each student) fast music maps from www.worldmapper.org *(Attachment 1–3)*

Procedure

EVOCATION / 10 min.

- Divide the students into two equal groups. Ask the first group to find as many things as possible in the classroom which were manufactured in Europe from local materials. The task of the second group is to find all those things in the classroom which come from other parts of the world, either considering materials used or the place of production. They can either bring those things to a designated place or just write them down and be able to point them out in the room. Remind them, as well, that they should consider not only the country of production, but also the origin of the materials the things were made from.
- After they have found the things ask them:
  - *How did you find out where the particular thing was made, and how did you know whether a local/ European material or a material from a different part of the world was used? Which things dominate– from non-European countries or from Europe?*
  - *What could the disadvantages of a high amount of imported goods be (for us, for the country where the good is produced, for the environment…)?*
  - *What are the advantages of imported goods (for us, for the exporting countries, for the environment…)?*
  - *Which goods that you found do they use water to produce?*
- Tell the students that water is used in the manufacturing processes of all products. That is why it is irreplaceable, not only for direct consumption, but it is used widely in industry, agriculture, services etc. Explain the concept "virtual water" to the students (the definition can be found in the *Infobox*.

REALIZATION OF MEANING / 25 min.

- Place all the strings that you have prepared beforehand on the ground. Explain to the students that these strings represent all the water in the world. Ask the students to take one loop each.
- Divide the students into two groups, approximately in a proportion of 80:20 %. Explain that you have divided them according to the real ratio: 20% of the world population, who are represented by the wealthiest people living in the developed countries, consume 86% of all the world's products. That means the smaller group (20%) are the consumers in the developed parts of the world. Explain that the larger group (80%) represents producers, who come mainly from developing countries.
- Afterwards ask the groups to stand facing each other – each group stands on the opposite side of the classroom. Explain that the distance represents the physical distance between continents. Each student in each group has one string loop at the beginning of the game. Ask everyone to place their loops on the ground in such a way that they form a circle. Then tell the students to stand in their loops.

- Tell the students you are going to play music. When the music is playing the students are supposed to move/ dance freely within their group's space (always within one half of the classroom, as if there was an imaginary boundary). Explain that when the music stops it is their task to quickly move to a loop and stand in it fully with feet, heels and toes. This means everyone must try to "survive" and they can survive only by standing inside a loop (by having water). Tell them that the number of loops is going to change gradually during the game. Explain to the students that during a certain number of rounds you are going to think about the use of water in the manufacturing of certain products and analyse what impact the production process has on water sources in the countries of production. Point out that it is not possible for anybody to stop playing or get out of the game before you finish the game officially. Everyone must find a way to survive (to remain standing in a loop). Devote a maximum of 5 minutes to each topic.
- Do a practice round with the students. Play music and stop it a few times. When you make sure everyone has grasped the rules, the game can start.

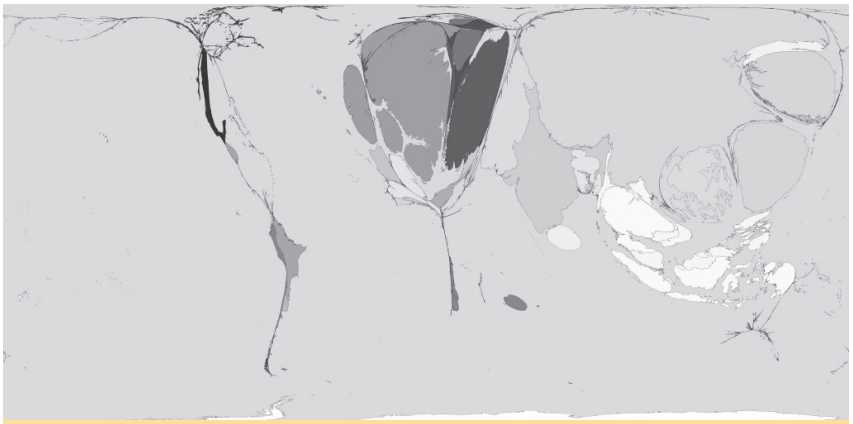
First Round

- Ask the smaller group from developed countries, i.e. the consumers, the first question:
  - *How much meat do you eat in a week, month or year?*
- Ask the students in this group to share their own estimates. Continue asking questions, but now also let the students from the other group, i.e. everybody, make their estimates. Always give them statistical data after a few tips.
  - *What is the world´s average consumption of meat per person per year?* *(30 kg per person per year)*
  - *What is the consumption of meat per person per year in India?* *(5 kg per person per year)*
  - *How much meat does an average Slovak eat in a year?* *(60 kg per person per year)*
  - *How much meat does an average American or a Dutch person eat?* *(120 kg per person per year)*
- After that, invite both groups to try to consider how much water they think is being used in meat production to satisfy the demand of the developed countries in the above mentioned amounts.
  - *What are all the things we need water for when keeping cattle?* *(growing feed, cattle drinking water, meat processing)*
- Furthermore, the students are supposed to think about the possible impacts of excessive consumption of meat on the supply of water in other parts of the world, i.e. in developing countries. You can bring the information from the ***Infobox*** and the Information on the Theme Pages at the end of this chapter into the discussion.
- When the discussion is over, ask the group of "consumers" to take two strings from the group of producers (the strings represent water). The consumers have a high consumption of meat and the products they bought and consume contain "water", which is why they, so to speak, take it from the developing countries. This means the consumers are now going to have more loops than group members and the producers less.
- Now play music. The students walk freely or dance around the loops of their group within the areas designated for their group. Stop the music in a while and wait till everybody finds a way to "survive". If the "producers" have less water (fewer loops) than other members in their group, encourage them to find a way to make everybody stand in the loops with their full feet. Repeat that everyone must survive, nobody may stay aside. On the other side, the consumers group has more water (loops) than they need. Now it is clear that because of the consumers´ excessive consumption, things are more and more difficult for the producers. Emphasize that groups are not allowed to help each other, only members of the same group.

Second Round

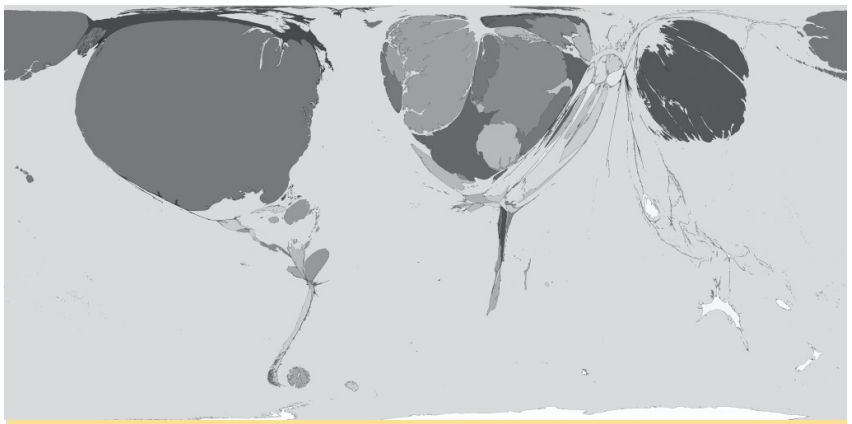
- When everybody is standing in their loops, ask the consumers' group the second question:
  - *How many pairs of jeans/ T-shirts do you have at home or buy in a year?*
- Invite the students of this group to share their own estimates. Afterwards discuss with all the students from both groups how water is used in cotton growing and its processing until its final form – clothes. Then ask everybody:
  - *Who are the main producers of cotton and clothes?*
- After a few tips you can show the maps of the world's main exporters and importers of clothes to the students (www.worldmapper.org, ***Attachment 1***). You can find more information on cotton growing in the ***Infobox***.

clothing exports



Territory size shows the proportion of worldwide net exports of clothes (in US$) that come from there. Net exports are exports minus imports. When imports are larger than exports the territory is not shown.

clothing imports



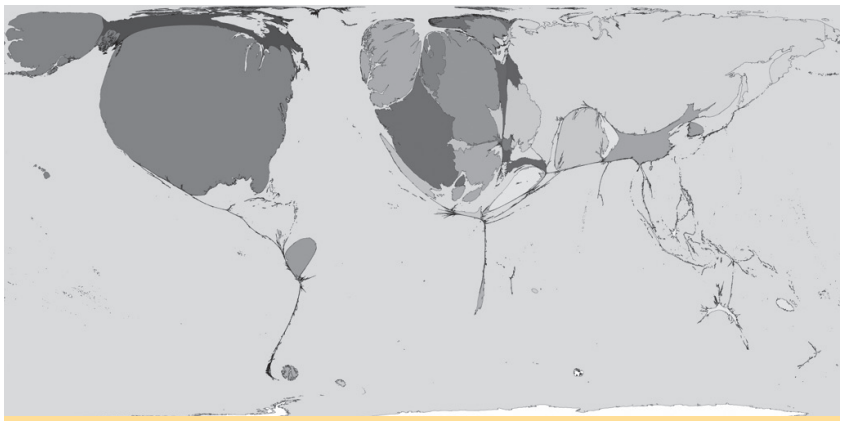
Territory size shows the proportion of worldwide net imports of clothes (in US$) that are received there. Net imports are imports minus exports. When exports are larger than imports the territory is not shown.

- Later ask the consumers group again to take two more loops of "water" from the producers group. Watch the producers´ reactions, when the consumers group comes to "take water" from them. You can ask both groups how they are feeling.
- Then play music again, encourage the students to move/ dance freely around the space designated for their group. Stop the music in a while and wait, till everyone finds a way to survive. It is more and more difficult for the group of producers - encourage them to find creative ways to make everybody stand in the loops. Emphasize again, that no one may get out of the game, everyone must survive, and that is why they must somehow manage together. The group of consumers still has more loops than they need. Do not allow the groups to help each other. If there is anything interesting happening within the groups, e.g. various emotions come up or conflicts arise, it is good to detect these signals and point them out. If the members of the producers group start fighting for water, it is good to mention that even in reality there are fights for water in some parts of the world, even wars for water.

Third Round

- When everyone stands in a loop, ask the following question, but this time ask the producers group:
  - *What products could you get from the consumers?*
  - *What goods or products could the "more developed" countries export to "developing" countries?*
- Invite the students of this group to share their own ideas.
  Students will probably come up with various products, ask the others as well to join in with their tips.
  If they do not mention weapons - because that is the product you are focusing on - tell them you only have one product on your mind.
  Show them the following map as a clue *(Attachment 2)*.
  Tell them that these are the countries which export this product:

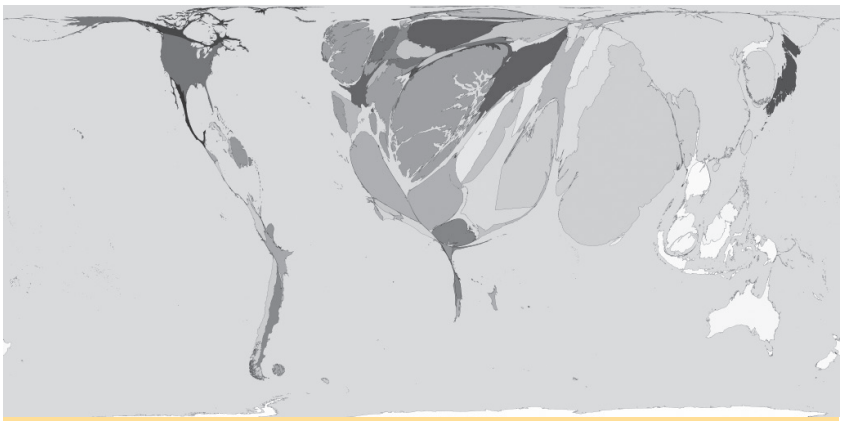
arms exports



Territory size shows the proportion of worldwide earnings from arms exports received there.

- After that show the other map to the students (Appendix 3) and tell them these are the countries where this product is imported and used:

arms imports



Territory size shows the proportion of worldwide spending on arms imports spent by that territory.

- Give the students space for some more tips. If they don't come up with the desired answer, tell them the product is weapons. Explain that developed countries invest huge amounts of money into the arms industry and they also export these products to developing countries, where several conflicts and wars take place. Tell them as well, that these pictures also show the numbers of those who died in war conflicts (you can find more information in the *Infobox*).
- Now tell the producers group that thus they are to take 2 strings of "water" from the consumers group of the developed countries.
- Play the music again, ask the students to move/ dance freely around the space designated for their group. Stop the music in a while and wait, till everyone finds their way to survive.

Fourth Round

- When everyone is standing in their loop, ask the consumers group the following question again:
  - *What present would you buy somebody for their birthday?*
- Invite the students of this group to share their ideas (the answers are usually flowers, chocolate, gold, silver, electronics etc.)

Explain that now you are going to focus on flowers only. Discuss with all the students from both groups how water is used in the process of growing flowers. Tell the students that the flowers at our florists' shops are grown and imported mainly from Kenya, Columbia or Ecuador (you can find more information in the ***Infobox***).

- Then focus on chocolate and you can open up the discussion on child slavery and the low purchase price of cocoa (you can find more information in the ***Infobox***).
- After that, ask the consumers group again to take 1 or 2 strings from the producers group. Play the music again and when you stop it everyone must find their place.

- Ask the students to remain in their places for another moment. Ask them if they think it is possible to reuse the water which was applied for manufacturing a certain product. It was very probably drinking water, so ask them if it is possible to utilize it for direct consumption again. Inform them, after a short discussion, that this water is most probably so polluted that people cannot consume it directly as before. Water is a limited resource and polluted water cannot be replaced by any new water. All the water we have at our disposal is here, and if we pollute it, we have no way to gain any more.
- For that reason, symbolically take away all the "water" (strings) which moved between the groups during the rounds (i.e. 8 strings in total), and put them aside, do not move them into any of the groups any more, and point out that this water which you took away was used for production during the game, and is now useless to them.
- Now tell the students they are not going to be two groups any more, but one unit, because now they are going to face the problem of the lack of water on all the Earth together. They have to find an approach to manage the situation in such a way so that everybody survives.
- Play the music again, but this time take away a string during the time the music is playing. When you stop the music, wait till everyone finds a place. Continue in this way and in each of the following rounds take away one string, until there is only the last loop on the floor. During this activity encourage the students constantly to find a way - in a creative manner - to survive, without anybody having to leave the game. The more loops you take away the more difficult it will be for everybody to stand in the loop with both feet. Remind them that it is not permitted to push anybody out of the game or to leave the game voluntarily. Everyone must stay in the game until the very end, till you finish the game. If the students do not have both their feet in the loop, leave the music off and wait till they adjust their position. If they claim it is not possible any more, encourage them that they can surely do it.
- This activity encourages students to adopt a creative approach to the situation and begin to "think outside the box". It is also very important that the students cooperate and help each other, otherwise they cannot make it. The solution is the following: if there is more than one loop in the game, it is possible to join a few strings together and tie them into one large loop. If there is only one loop left, the possible solution is, that all students sit down on the ground in a circle around the loop and put only their feet inside it.
- If they do not come up with any solution, you can give it to them and let them try it out.
- At the very end you can talk about everyone's impressions from the activity. Support the discussion with questions, e.g.:
  - *What was the biggest surprise for you?*
  - *How did you feel in your roles?*
  - *What could you do about such a situation?*
  - *How can each of us contribute to change?*

Infobox

The 50 million richest people in Europe and North America have the same income as the 2.7 billion poorest in the world (*according to the World Bank study, 2002*).

Slovakia is one of the top thirty most developed countries in the world.

One billion people have no access to drinking water. The UN estimates that by 2025 approximately two thirds of the world's population will experience some lack of water. Problems with drinking water could increase not only due to climate changes but also due to our careless attitude to it. We are under the threat that water will become the new oil and a pretext for future wars.

Virtual water is the water used in any kind of production or activity. In other words, this concept refers to the amount of water used for the manufacture of goods in the place of production.

For example, a morning cup of coffee does not actually contain a few gulps of water, but 140 litres of water spent in growing, collecting, packaging, transport and preparation of the aromatic grains.

90% of soya grown in South America is used as feed for cattle in developed countries.
The remaining 10% is used for direct consumption or as an emulsifier. To produce such an amount of soya it is necessary to apply intensive farming, which takes up large areas of land. Soya plantations arise on land previously cleared from rain forests; for that reason the land is not fertile enough and artificial fertilizers, pesticides and watering must be applied. The production of one kilogram of meat requires the same amount of water that an average household uses in 10 months (if each member uses 50 litres per day).

North America and Europe use 45% of the world's cotton products, in spite of the fact that only 13% of the world population live here. Water is used in every step of clothes production. It is used to transmit the chemicals into the fabric as well as to wash them out before the next step. The water becomes saturated with the chemicals and is discharged as waste water into the sewage system, which further pollutes the environment.

Approximately 95% of all flowers which we buy in Slovakia are imported. More expensive species are grown in the Netherlands; however, the majority of more affordable roses, carnations, Barberton daisies and other species come from east Africa or South America. There are a number of reasons for this: suitable climatic conditions during the dormancy period in our area as well as cheap labour and low environmental and working standards. The negative impacts of growing flowers in developing countries for the needs of the developed countries are:

- Enormous environmental burden (flowers must be transported by air).
- Bad working conditions for the growers.
- Drawing water from areas where it is scarce.
- Water pollution by chemicals needed for growing flowers (fertilizers, spraying).

The livelihoods of 50 million people of the world depend on cocoa production. Up to 70% of cocoa comes from West Africa; the rest is grown in South America and Asia. From the price of a purchased bar of chocolate the grower gets only around 7 %.

The estimates show that up to 280 000 child slaves work on cocoa plantations in the Ivory Coast. Due to the high demand for chocolate in rich countries, 8 million hectares (the size of the Czech Republic) of rain forests have been cleared in order to found cocoa tree plantations in the Ivory Coast since 1960.

FAR AND NEAR

TAKEN FROM THE PUBLICATION „THE WORLD IN ALL SUBJECTS“ BY NAZEMI AND ARPOK

Goals:	Students find out what crops are most often imported into the Czech Republic, why they are imported and where from. Students analyze the information for consumers provided on the packaging of various products. Students form arguments for and against importing crops (food products), which enables them to develop their own opinion. Students study the map of the world.
Curriculum links:	Geography
Age:	13+
Time:	45 minutes
Materials:	posters with information about crops *(Attachment 1)* packaging of various food products – every student brings one piece of packaging where the place of origin is stated (e.g. empty wrapping from coffee, tea, rice, biscuits, pasta, yogurt, juices, jams, dried fruit, chocolate, cheeses, sweets, a string bag from oranges, a packet from a piece of clothing and so on) blank map of the world (one of the attachments at the end of the book) – one for each student

Procedure

EVOCATION

- To begin with, ask the students: *What did you have for breakfast today? What are you going to have for snack? Do you like chocolate? And exotic fruit? Do your parents drink coffee?*
- Put students into small groups (you can find ideas on how to do that in the introduction to the book). Their task is to make a list of as many imported food and drink products as they can think of in two minutes, stating where each of the products probably comes from. When the time is up, let the students introduce their ideas. At this stage of the lesson do not make corrections, but leave space for discussion and assumptions. The aim is to realize that many food products and crops, which are common in our diet, come from far away.

REALIZATION OF MEANING

- In the following part of the lesson concentrate on the individual food products (crops) for which the students have brought packaging. It is recommended that the students be given an accurate list of all the products and crops for which you will need packaging in this lesson. The students continue work in their groups. Each group gets a piece of paper to copy the following table on:

What?	Where planted? Where does the crop come from?	Where produced?	Where bought?

- Each group now has a few minutes to explore the packaging. At the same time, give every student a blank map of the world. According to the information from their tables, the students draw arrows into the maps starting in the country of origin (not production) and leading to the Czech Republic. Students are allowed to use the world map collections. Students should realize independently that all the information required in the table cannot always be found on the packaging or be deduced from the product itself.
- Class work. Give space for potential discussion in the class:
  - *What have you found out? Where do the products or crops come from?*
  - *What did you find interesting? What was surprising for you?*
  - *Were you able to find all the information on the packaging? If not, why do you think the information is not given on the packaging?*
  - *Did the activity raise any questions? Is there anything you would like to know about a product or crop?*

  Write the potential questions on the board and tell the students that you will come back to them later. The answers will either come up in the following part of the activity or you can then agree with the students on their volunteering to find the answers.
- Tell the students that they will now learn more about six crops which are on the top of the list of crops imported to the Czech Republic. Ask students to try and name some of them (rice, tea, cocoa, coffee, bananas and oranges). Pin up posters with photos and information about the crops ***(Attachment 1)***. Students in their groups walk around the class, read the information on the posters and add new crops to their tables. Every student should take a piece of paper and a pen and note down a piece of interesting information from each poster. When students are finished studying the posters they can use the collection of world maps again to draw new arrows into their blank maps. Tell the students that it is enough to draw up to three arrows for each crop (it is not necessary to draw arrows from all the countries mentioned on the posters). Ask the students to compare their maps in the group or in pairs with students from other groups.

- As a part of feedback, discuss the question of why some food products that we eat daily are produced in the Czech Republic and others come from very distant places. You can ask the students the following questions:
  - *Why are crops imported to the Czech Republic from so far away?*
  - *How are the crops imported? What means of transport are used?*
  - *For our ancestors, most of these food products were very exotic or were unknown. Why is this different now? What are the reasons for this change?*

  The aim is for the students to realize not only that these crops cannot be grown in our country because of climate and natural conditions, but also that the world trade rules are set so that it is financially advantageous to import them.
- To conclude, ask each student to create his/her own T-diagram: under the title "Import of Food Products" draw a big T. Complete the left column (left part of the T) with 2 – 4 arguments for and the right column (the right part of the T) with 2 – 4 arguments against the import of food products. It is important to write down both - pros and cons. The point is not to write only the arguments which one personally agrees with, but to provide a variety of arguments connected to the topic. Point out that every argument must be written in the form of a sentence.
- After completing the T-diagram, students work in pairs to discuss their arguments together. If their partner mentions an interesting new argument, the student should copy it into his/her T-diagram. If there is time, let the students change partners and repeat the process. Another possibility is to ask the students to form a "town square": students stand up, walk around the class and talk to various other students. The T-diagram and sharing arguments may help students to view one problem from different points of view, to learn to listen to others, and to accept others' opinions for their own enrichment.
- Finally, ask students to read through all their arguments again and highlight one which they personally consider the most important. If you want to visualize students' ideas, draw an imaginary line between two parts of the classroom – e.g. the area in front of the board (represents the strongest argument for imports) and in the back of the classroom (the strongest argument against imports). The students stand either in the "for" or "against" part of the classroom according to the argument they highlighted/the opinion they adopted.

Sources:

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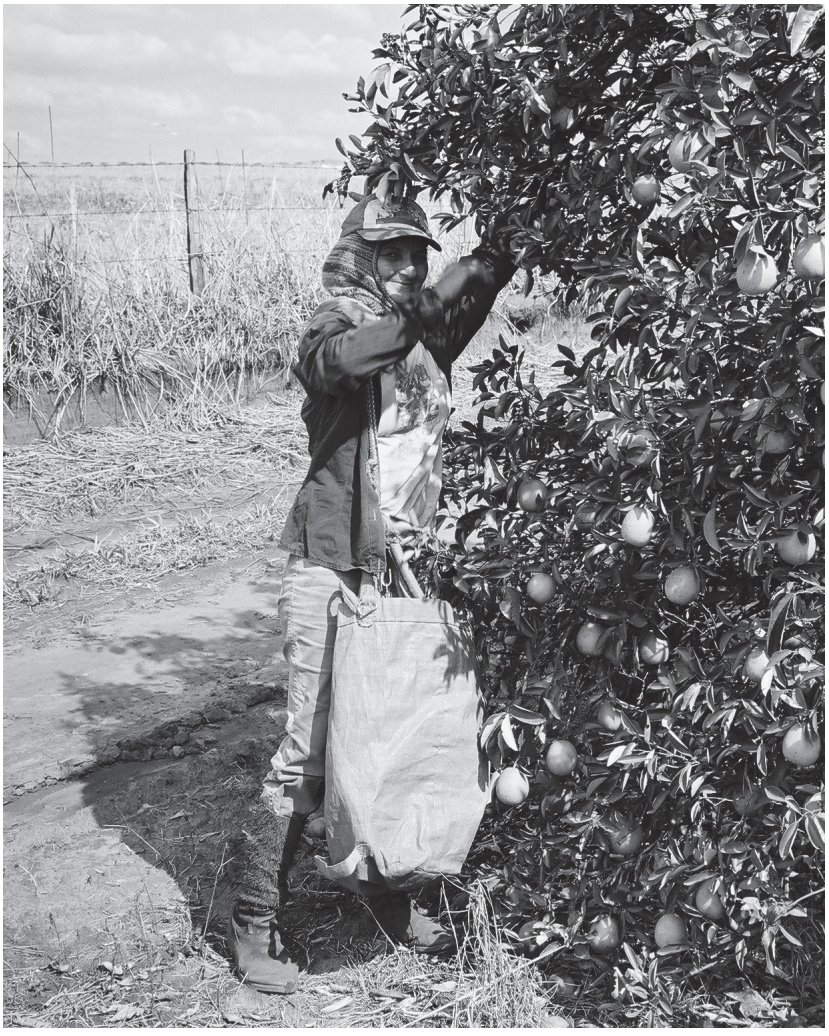
www.fairtrade.cz
http://kakaovnik.navajo.cz
www.chokladkultur.se/facts.htm
www.caffe.cz/info/botanika-kavovniku
www.fao.org
Školní atlas světa (Collection of maps of the world for schools) (2007). Vizovice: ShoCart.
Rychtecká, M.; Pavlíčková, M. (ed.) (2009): *Svět do všech předmětů*. Brno: NaZemi – společnost pro fair trade, ARPOK.

Attachment 1

ORANGES

- they originate in south China, Vietnam and northeast India
- the biggest producers currently are Brazil, the USA (Florida and California), Mexico, India, China, Indonesia, Spain, Iran and Italy (source FAO, 2007)
- orange juice is the most sold and used fruit juice (the biggest exporter of orange juice for the Czech market is Brazil)
- the Persian variant of oranges, which was introduced to Italy in the 11th century, was bitter; in the 15th century it was replaced with sweet oranges from India
- they contain a large amount of vitamin C, which can help to decrease blood pressure and the cholesterol level in blood
- they contain magnesium and pectins (which stimulate digestion)
- they contain 87% water
- orange trees are also grown as ornamental trees
- they are used in the perfume industry – essential oil is pressed out of leaves, water from the flowers is added to creams and body lotions
- the leaves can be used for making tea
- dried rind repels slugs and moths



BANANAS

- the first record of banana planting dates to about 5000 BC on New Guinea
- the first banana orchard in China was established around the year 200 AD
- around the year 650 bananas were brought by Islamic inhabitants to Palestine and then by Arabic traders to Africa
- in 1502 the first banana plantations were established in the Caribbean and Central America
- the biggest exporters: Ecuador, Philippines, Costa Rica and Colombia
- the biggest producers: Uganda, China, Brazil and Indonesia (for the local market, only a small part of production is exported)
- the banana plant is a herb, it can grow up to 16 meters high, the commonly grown hybrids reach about 2-10 meters; the plant is among the tallest plants in the world
- the bananas grow in bunches, which can weigh up to 60 kg
- the fruit of wild banana plants is inedible
- bananas contain a large amount of magnesium, they have a calming effect on the stomach and help to sustain normal blood pressure
- bananas can be of red, green or purple colour
- the so-called green bananas are harvested unripe and are eaten boiled, roasted or fried or can be ground into flour

RICE

- this grain comes from Thailand (the first record comes from the year 4000 BC)
- it was brought to west Asia and Greece by Alexander the Great's armies (about 300 years B. C.)
- in the time of the Roman Empire, rice was grown all around the Mediterranean sea, in southern Europe, southern Africa and in Egypt, however the yield was much lower there than in China or India
- typical rice fields were developed in China, and the irrigation system prevents weeds from growing around rice, and that is why the rice plants are strong and healthy
- in the 16th century European settlers brought rice to North America
- there are many different kinds of rice – according to the area where it is grown and the intended use. The most popular kinds are jasmine, wild and basmati and arborio rice
- we distinguish white, unpolished and brown rice and also long-grain, medium-grain and round-grain rice
- the biggest world producers of rice are: China, India, Indonesia, Bangladesh, Vietnam, Thailand, Burma, Philippines, Japan and outside Asia: the USA, Brazil; the biggest producer of rice in Europe is by far Italy (rice from here is also imported to the Czech Republic)
- rice is an important source of proteins and has a positive impact on those with stomach disorders
- in some oriental cultures rice is a symbol of fertility, which may be the original idea of the custom of throwing rice for newlyweds

COFFEE

- coffee beans are the seeds of a dark green plant with red fruits and white flowers
- an average coffee plant yields about 2000 coffee beans a year (that is about 1 kg)
- the biggest consumers of coffee are the Swedes, who use about 11 kg of coffee a year
- one of the legends about the discovery of coffee says that people in Ethiopia noticed that goats which were gnawing on coffee bushes were hyperactive and "happy" afterwards
- until the end of the 18th century coffee was grown only on the Arabian peninsula
- about 25 million agricultural workers, mostly from poor countries, make their living growing coffee
- Arabian coffee (arabica) is a bush which grows up to 3 meters high and yields its first fruit after about three years of planting; it can produce fruit for up to thirty years, depending on conditions and particular variant; the beans from Arabian coffee are of the highest quality; its main producers are Brazil, Indonesia, Ethiopia, Colombia, Mexico, Central American countries and Peru
- Robusta coffee already yields fruit two years after planting, its fruit ripens continuously all year round and this coffee can be grown at lower altitude; the beans contain more caffeine than arabica beans; the biggest producers of robusta coffee are Vietnam, India, Brazil, the Ivory Coast and Uganda

COCOA

- the cocoa tree is an evergreen tree, which originated in the tropical areas of Mexico
- cocoa is a curiosity in the plant kingdom because its flowers grow straight from the trunk and old branches
- the first record of cocoa comes from more than 3000 years ago
- the native inhabitants of Central America considered cocoa the food of the gods. The Mayas and Aztecs used cocoa not only as a drink, but also as means of payment and production of medicines
- the Spanish conquistador Hernando Cortés brought cocoa beans to Europe
- at the end of the 19th century, the cocoa plant was introduced to Africa, which has become the biggest grower and producer of cocoa beans
- in 1847 the first chocolate was made
- 70% of cocoa is produced in west Africa, the biggest world grower being the Ivory Coast (40%), the other big producers of cocoa are Indonesia and Ghana (about 15% of the world's production each), Brazil, Nigeria and Cameroon
- cocoa beans are used for making cocoa and chocolate, and the fleshy coverings around the beans are used for making juice
- during harvest, individual fruits are cut off with special hooked knives
- from 6000 flowers only about 20 fruits will ripen (that is about 10 kg, from which 2 kg of cocoa mass is extracted)

Photo: Pavla Začalová, CONACADO, Dominican Republic, 2005

TEA

- tea results from processing tea plant leaves
- from the botanical point of view, the tea plant is an evergreen bush, which can naturally grow up to 5-15 meters high; on plantations the bushes are maintained at a height of about 1 meter
- the plant gives fruit for about 25 years, but it can live for more than 100 years
- the tea plant grew naturally in southeast Asia and the border areas of China and in India
- it has been grown in China and Tibet for more than 5000 years
- it was brought to Europe in 1610
- the biggest producers of tea are China, India, Sri Lanka, Taiwan, Japan, Indonesia, Turkey, Vietnam, Argentina and Kenya
- tea is the most popular drink in the world, the biggest consumer is Great Britain – 2,3 kg per person per year
- one of the most important jobs on a plantation is the collection/picking of tea leaves, which can begin 4 – 6 years after planting
- tea leaves are picked several times a year, in some parts of the world all year round
- even though tea production is still growing, the leaves are with few exceptions (e.g. Japan) picked by hand
- the most general classification of tea is according to the processing of the leaves: fermented (green, white), half-fermented (oolong), fermented (black) and post-fermented/maturing (e.g. phu-er)

source: GEPA, Sri Lanka

DISCOVERING AND TRADING

TAKEN FROM THE PUBLICATION „THE WORLD IN ALL SUBJECTS“ BY NAZEMI AND ARPOK

Goals:	Students will know how to explain the concept of economic globalization and enumerate the pros and cons. Students will think of the historical context of an economic globalization. Students will perceive themselves as a part of the world economic system.
Curriculum links:	History, Economics
Age:	14+
Time:	45 minutes
Space:	classroom
Materials:	world trade routs ArchAtlas maps *(Attachment 1)* – one for each student texts for each group *(Attachment 2)*– one for a group a paper timeline (or centuries written on individual sheets of paper) a map of the world a school atlas of the world

Procedure

EVOCATION

- First, ask students:
  - *What have you had for breakfast? Have you drunk or eaten something from the Czech Republic? If not, where from?*
  - *Where do those things you are wearing today come from?*
  - *Do you think that a Brit, for example, could have had a cup of tea in the 15th century? (Yes)*
  - *And could he have made cocoa? (No)*
  - *And could he have had some potatoes for lunch? (No)*
- Prepare paper stripes for „a timeline“ before the lesson. It will represent periods from prehistorical times to the present, where milestones stand for individual centuries. (You can use another variant instead of one long paper – outline a line on the floor and put papers representing individual centuries down) Instruct students to write an era or a period when they think international trade started, each on their own piece of paper. First ask students how well they understand the concept of international trade. Explain that in this context, we mean any trade between regions, disregarding problems of how to define the concept of a nation.
- Students deploy their pieces on the timeline and stand close to them if possible. Let students introduce individual positions on which they are standing:
  - *Why have you decided to choose this period? What were people trading in that time?What enabled further development (e.g. which inventions)?*
  - *Don't make comments about their answers. Write them down on the board.*

REALIZATION OF MEANING

- Next, show world trade routes from ArchAtlas (see Sources). When there is no data projector or interactive board, print world trade routes from these websites out. Make comments. Routes end in 1500. Ask students the following questions:
  - *What do you expect the next developments to be? How do routes look like in other parts of the world?*
- Divide students into five groups – America, Africa, Asia, Europe and Australia. Distribute maps – *(Attachment 1)* (one for each student and give a text regarding their continent to each group *(Attachment 2)*. The students' task is to imagine a continuation of the development of trade for their continent. Make them finish within ten minutes and let them present their work in front of the others or create new groups in order to have one representative of each continent there.

- Ask students:
  - *Which inventions do you think accelerated the development of international trade?*

  Students enumerate inventions. Complete the list if necessary – the invention of the printing press, the transition from sailboats to steamships, the development of railways, the construction of canals (Suez, Panama), the development of aviation, the development of radio-telecommunication, the development of media (radio, television, Internet etc.) and social phenomena generally supporting globalization (international trade, wars, world politics, lifestyle changes – tourism, migration).

- Moreover, ask the following questions:
  - *What do you think the concept of globalization means?*
  - *Which pros and cons does it have or did it have?*

  Give students (e.g. in pairs or in small groups) a few minutes to write down as many pros and cons as possible. Then check their ideas all together. Feel free to complete with more information (see ***Infobox***).

Recommendations

If there is enough time, you can ask students to write an essay on the topic:
How would your everyday life be without international trade?
You can also use it as homework.

Sources:

www.archatlas.dept.shef.ac.uk/Trade/Trade.php – Andrew Sherratt's maps: *Arch Atlas*, January 2008, Edition 3.
Greengrass, Mark et al. (1998): *Atlas objevů*. Praha: Knižní kubl Balios. Parker, G. (1999): *Atlas světových dějin*. Praha: Knižní klub Balios.
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Infobox

Whilst global trade is an issue of the last 60 years, remote trade between countries arose a long time ago. One of the oldest exchanges between regions was the trade in obsidian, id. volcanic glass, which was already being exported thousands of kilometres from the area of present-day Turkey in 14 000 BC (late ice age). Trade route development is related to the development of city centres and inventions facilitating trade transactions.

Some important periods in the history of trade:

4000 BC: The first paths connect towns in the so called Fertile Crescent, i.e. areas of present-day Iraq, Syria, Lebanon, Israel, Jordan and Egypt, where the first agriculture developed. Mesopotamia (today eastern Syria and Iraq) was a part of this area which saw the invention of the wheel and the potter's wheel.

2000 BC: While the **Egyptians** sailed mostly along the Nile and the Red sea, they imported luxury items like ebony, ivory, gold, incense, myrrh, rare wood, but also animals – baboons.

1100 BC: The **Phoenicians** were excellent sailors and sailed the Mediterranean Sea and along the coasts of Africa. Their home was in present-day Lebanon. From 1000 BC to the time of Christ there was no real competition for them, and they founded many seaports, the most important of which was Carthage. They even reached the British Isles, from which they imported tin for their weapons.

700-200 BC: The **Greeks** also sailed the Mediterranean Sea and were good traders, importing everyday foodstuffs – crops etc. They sailed to Western Europe, taking philosophers and geographers along with them.

The Amber Trail (200 BC to 400 AD) lead from northern Europe and the Baltic coast through Central Europe to Italy, Greece and Egypt. Mostly amber, but also honey, fur and slaves were taken from the North. From the South, products of Mediterranean craftsmen, bronze and glass containers, art products.
The Silk Road (beginning in the 4th century BC, declining in the 10th -13th centuries, gone by the 17th century) was one of the greatest inland routes, connecting the Far East (India and China) with the Mediterranean area, the rest of Europe and the north of Africa. Its main branch started in the Chinese town of Si-an and went through Asia Minor to the Mediterranean Sea with an overall length of 8000 km.

The voyage from Asia to Europe lasted from 18 months to 2 years. Merchants traded not only silk and fine cloth, but gold as well. This trade brought contact between cultures, religions and philosophies, as well as the Romans' trade deficit and later on, the Black Death. This age-old land route lost its importance when sea routes were developed.

1000 AD: Viking adventurers were the **first Europeans to sail to the shores of America.**

From the 12th to the 17th century: The German Hanseatic League (a federation of cities) carried out long-distance trading.

15th century: The centres of European trade were Venice and Genoa. The rapid expansion of trade encouraged advances in **navigation**. New lands were discovered overseas (in 1488 the Portuguese reached the Cape of Good Hope), especially the so-called discovery of America, after which the **colonization of the New World** began. The routes connected Spain, Portugal, and South America.

1602: The **Dutch East India Company** was founded, which can be considered both the first publicly held company and the first international company. With its 150 merchant ships and its 50,000 employees, by 1669 it was the richest company in the world. Its interests were defended by a private army of 10,000 soldiers and 40 warships.

1784: The monopoly of the Dutch East India Company was taken over by the **British East India Company**, which got the right to trade with the East Indies.

17th to 19th centuries: **Triangle Trade**: Africa-Western Europe-United States of America. Europeans (primarily the British) carried arms, textiles, jewellery and alcohol to Africa, where they traded them for slaves. The slaves were taken to America as cheap labour. Precious metals, cocoa, coffee and so on were carried from America to Europe. This trade generated huge profits, which made possible the industrial revolution.

1804: The first **steam locomotive** is produced in England, the first tramway and electrified railway in 1883.

1859: In **Pennsylvania, in the United States**, the first efforts were made to extract petroleum.

1896: The first car with a diesel motor was produced.

1903: The Wright Brothers made mankind's **first controlled aeroplane flight**.

1913: The **Panama Canal** was opened to connect the Atlantic and Pacific Oceans.

Greater integration and globalisation was aided by the founding of the **World Bank** and the **International Monetary Fund** in 1946.

In the 50s and 60s of the last century there was a wave of decolonisation. A legacy of the colonial administrations is a state where developing countries commonly export agricultural and other primary commodities, and the North makes products with a high added value.

1947: The **General Agreement on Trade and Tariffs** (GATT) was reached. It was a multilateral agreement setting out rules for the management of international trade.

European integration: starting in the 1950s, a European common market gradually arose, followed by economic and currency union, the largest economic integration to date.

1988: The **Internet** begins to be used for commercial ends, in 1992 it expands among a greater circle of users, and in 1996 the "www." project begins.

1995: The **World Trade Organisation** (WTO) is founded, replacing the GATT. The General Agreement on Trade and Services (GATS) and an agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) are signed.

Today there is trade in securities, currencies, and virtual funds as well as in traditional goods. Thanks to the internet and faster transport, commercial transactions are very fast. Surprisingly, shipment of goods between continents is made mostly by ship (80%), since shipment by air (20%) is incomparably more expensive. On land road transport dominates. It si close to being true, that any product that exists is available anywhere in the world.

Sources:

Sherratt, A. (2004): "Trade Routes: the Growth of Global Trade." *ArchAtlas*, Edition 3 [online] accessible at www.archatlas.org/Trade/Trade.php. (quoted 10/6 2012)
Buckman, G. (2005): *Global Trade. Past Mistakes, Future Choices*. London: Zed Books.

Attachment 1

Attachment 2

EUROPE

Before the voyages of discovery

European states traded mainly between each other: France – Great Britain – Spain – Austria. The Silk Road, connecting Asia and Europe for more than 2000 years, was another significant trade route. It lead from China through the Middle East to the Mediterranean Sea. There was also trade between Spain and Morocco.

18th century

Europeans reached almost every part of the world. They discovered routes to North, Central and South America, and colonies established along the coasts of the new continent began to trade with their home countries. Moreover, trade between Europe and Asia was greatly expanded, especially that between Great Britain and India. The Portuguese established their first colonies on the western coast of Africa, from which they exported slaves to Central America and Brazil, together with other powerful countries. European sailors also discovered Australia, which soon became a penal colony for Great Britain.

The turn of the 19th and 20th centuries

Europeans consolidated their position in the world. They actively traded between each other and also had complex trade relationships with their colonies in Africa (e.g. Great Britain with areas of present-day South Africa, Zambia, and Botswana, or France with areas of present-day Algeria, Morocco and West Africa; Germany with areas of present-day Namibia, Cameroon and Tanzania). Furthermore, they traded with colonies in southern and south-eastern Asia (e.g. Great Britain – India and Hongkong, France – Indochina). The discovery of gold in Australia also attracted their attention.

AFRICA

Before the voyages of discovery

The north and to some degree the east of Africa was controlled by Muslim buyers, who established a trade route through the Sahara and established ports on the eastern coast of Africa. Moroccan merchants traded with the Spanish.

18th century

Africa was gradually colonized by European countries, and slaves were the most important items traded. In one type of trade, they were taken by Europeans (Portuguese, British, German, French and Italian) from the western coast of Africa to South and Central America. This was part of the so-called "triangle trade". In another type of trade, Africans were kidnapped by Muslim buyers from the centre of the continent, taken across the Sahara and sold to Asia.

The turn of the 19th and 20th centuries

The peak period of colonization. European powers competed with each other to get individual areas. Trade was mainly between mother countries and their colonies, e.g.:
Great Britain traded with colonies in the area of present-day South Africa, Zambia and Botswana.
France with colonies in present-day Algeria, Morocco and with the western part of Africa.
Germany with colonies in areas of present-day Namibia, Cameroon and Tanzania.
Trade routes also existed between the territories of present-day states in the eastern part of Africa (Kenya, Tanzania) and India.

ASIA

Before the voyages of discovery

Conflicts and wars between countries hindered the international trade. However, the Silk Road had existed here for a long time. It lead from China through the Middle East to the Mediterranean Sea. Silk and porcelain were taken from China to Europe, while gold and silver from Europe and the Middle East were taken to the East.

18th century

South Asia was gradually colonized by powerful European countries. The trade between Europe, India and China grew many times over. Of European states, the states with the most colonies were Portugal and Spain, later Great Britain, France and the Netherlands. European countries also traded with the islands of southeastern Asia and with Indochina. Products were still taken over the Silk Road, connecting the eastern and western parts of Russia. Japan was a very interesting state at that time – they limited all their foreign contacts, trading included.

The turn of the 19th and 20th centuries

Europeans consolidated their positions in southern and south-eastern Asia, and trade was mainly between mother countries and their colonies (e.g. Great Britain – India and Hongkong, France – Indochina). There was also some trade between the eastern coasts of Africa and India. Japan also started to trade internationally, and inland routes were still used.

AMERICA

Before the voyages of discovery

There were Aztec and Mayan Empires in the areas of Mexico, and the extensive Inca empire in the area of Peru. However, there is no evidence that the empires traded between each other. Nor did they trade with countries from other continents.

18th century

Europeans occupied the eastern coast of Central America, Middle America and the coast of South America. There were two types of business relationships: first, trade contacts between freshly established colonies and Europe, e.g. between North America and Great Britain, or Brazil and Portugal. The second type of business contact was the trade in slaves which Europeans imported from the western coasts of Africa (from Senegal to South Africa) to Brazil or the Caribbean.

The turn of the 19th and 20th centuries

The USA became a global economic power. There was trade mainly between the USA and Great Britain and France. In South America, countries traded between each other, and they also had business contacts with Europe: mostly with Spain, Portugal, France and Great Britain.

AFRICA

Before the voyages of discovery

Only aboriginals lived on the continent and they had no overseas trade. The country was isolated from foreign trade.

18th century

Australia was used as a penal colony for Great Britain. However, the aboriginals protested, so the colonization process was slowed down. Only seal products and sandalwood were traded between Great Britain and Australia.

The turn of the 19th and 20th centuries

In New South Wales (South-eastern Australia), gold was found, and sheep-breeding and the wool trade were developed in New Zealand. The trade between Great Britain and Australia was strengthened. Furthermore, there was the development of trade routes between Australia, New Zealand and the islands of Southeast Asia.