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Nordplus

GREEN CREATIVITY FOR TEACHERS OF ENTREPRENEURSHIP

TEACHERS' GUIDE for teaching entrepreneurship

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INTRODUCTION

This guide is written by partners in the NordPlus Horizontal Programme for teaching entrepreneurship (and also economics) in a more interesting way that involves students more. We have paid more attention to increasing creativity in young people and also to paying their attention to environmental aspects of doing business as businesses have been the biggest source of environmental impact directly and indirectly already for centuries.

Educators from all three countries looked through their own teaching methods and activities that they use for teaching youngsters themselves. Some activities have been taken over, some of them have been developed into more „green“ ones. The next step was searching the internet for the methods that others have used and what were offered for public use for free. These activities were also taken over and adapted for the project. In the process of creating materials environmental specialists were consulted. We have also looked through the activities for bringing more IT into entrepreneurship studies, so that many activities can be managed through the internet too.

All activities have been tested at teacher training in participating countries and in two participating schools. During the testing process amendments were made. Remember: you may change all the games – creativity is welcome in Education process, especially when teaching entrepreneurship.

ACTIVITIES FOR OBTAINING GENERAL KNOWLEDGE ABOUT GREEN ENTREPRENEURSHIP

1. Fishing Game

Explain to students that the main problem to be solved in economics is SCARCITY of resources and this problem is actually equally for rich and poor people and rich and poor societies. The fishing game consists of three stages.

First round: Ask four or nine volunteers to come in front of the classroom. The number of volunteers is your own choice and you can also use another number of participants but then you have to use your creativity in dividing the „lake“ space into equal territories in the second round. How you draw the playing space on the floor depends on the number of players but it will be important for the second round, not for the first one.

For this game you need 30 paper clips or paper pellets made from used paper). You can reduce or increase the number of clips if you want to. You have to draw a circle or a square to the floor with chalk or use adhesive tape (preferable from paper) to mark the territory. Tell students that this is the lake where fishes live and their families get their income from fishery. The volunteers stand around the square or circle. Teacher tells them that the clips are fishes and throws the clips on the floor. The clips that fall outside the marked territory are dead and not edible, so it is prohibited to pick them up.

The teacher writes on the board the simple principle of how the price of fishes varies depending on the fishing time.

First 20 seconds – 5 cents

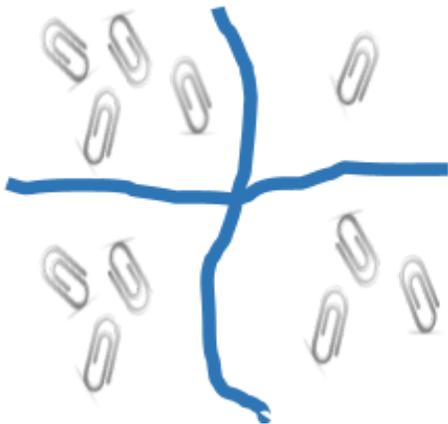
Next 20 seconds – 10 cents

The teacher is free to change the fishing time and also the cost of fishes but the periods have to be with equal length and money doubled during the next period. You can also replace money with small candies or some other award.

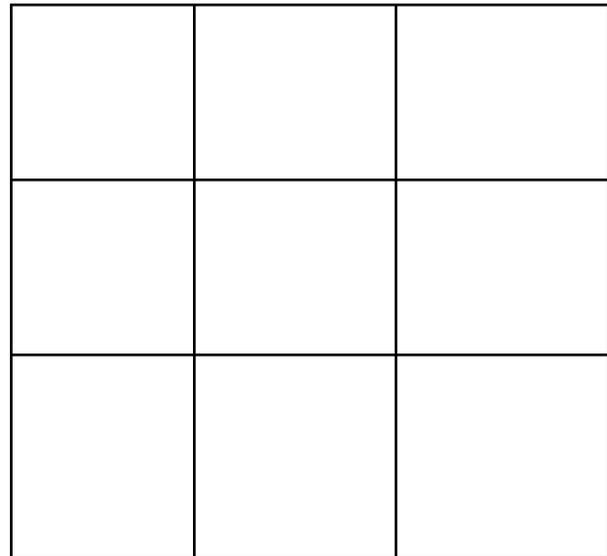
When the teacher says: START, students are allowed to start picking clips, i.e. fishing. When the time is over, the teacher buys the fishes from fishermen.

Students are not allowed to speak. What happens? Almost always all clips are picked up during the first period and there will be no second one. Ask students why it has happened and analyze it. Usually people are rational and self-interested as economics assumes. As the first person has picked up a clip, others are afraid to get nothing and also rush to pick them.

The second round. Use the same volunteers or ask for new ones. It is better to use the old ones as then it is sure that the result does not depend on the individual characteristics of people, but you may also invite other students to increase the involvement. Now divide the marked territory into almost equal parts.



For 4 players



For 9 players

Each player gets their own territory and is not allowed to pick clips from outside it. The other rules remain the same. Throw the clips up again. What happens now?

Usually nobody picks clips during the first period, and everything is picked up during the second one. So it is more efficient for the economy. But – the result is unequal as clips do not fall down equally to all sectors. Here it is possible to discuss the difference of private property and commonly owned property. And also the difference of resources owned by private people and countries. **It happens that these students whose „lake“ was empty like more the public property as there they got at least something.**

The last question to students in this round will be: but what was left for the next generation? You have taken all the fish out of the lake!

Third round: Discussion of students how to motivate fishermen not to take all fish out of the pond. Is it possible to convince all private people to keep some of them also for the future? Who has to do it? What is the role of government? Education?

On-line version

This game is a classroom one and cannot be used on-line. All modifications that we have tried to bring into this simulation lacked the spontaneous reactions to other participants' behavior. For on-line lessons we suggest discussions about advantages and disadvantages of private and state owned property from the point of view of economical efficiency and environmental impact. What can be done to be efficient and environmentally friendly at the same time? Who has to take initiative? Will it be the end of the free economy?

2. Clean the Lake

The teacher brings a bag of different trash, some wrinkled papers, bottle corks, cones, whatever is possible, but the trash bag has to contain also very small trash – small pieces of paper, paper sequins, leftovers of hole punchers, etc., that are hard to pick up.

Teacher asks for 2 volunteers to come for help. She pours out all the muck from the trash bag and tells students that this is a polluted lake. And there are hundreds of them in the region. Volunteers have to „clean the lake!“ Fishes do not live there anymore and it is impossible to swim there. The lake is going to disappear if it is not cleaned.

Students are instructed to pick everything up by hand. No tools are permitted. They have 20 seconds to clean the lake as much as possible by putting the trash into a trash bag. This is a dirty work. They have to wear protective gloves. Government will pay 100 € for this work (50 to each person). THIS MONEY IS NOT TO BE PAID OUT, some awards can be given.

Play three rounds and use a different bag for collecting trash each time. The amount of trash collected into the bag is declining each round. WHY?

Here the Law of Diminishing Returns can be discussed. That is, the *marginal* benefit in added cleanliness is declining for each 20-second increment, but the government continues to pay the same incremental cost (*marginal* cost) for each 20 seconds of cleanup.

Discussion: When we run out of funds allocated for cleanup, should we continue? Continuing to clean the lake requires reallocating the budget from other areas.

What is the opportunity cost of cleaning the lake further? Other lakes needing to be cleaned? Education? Welfare to the poor, etc.? How long have we continued cleaning this one lake?

On-line version.

This game is a classroom game. For on-line (in Zoom, Teams, etc.) the teacher can tell the same story: There are several polluted lakes in the region which need cleaning. If it is not done fish will die, it is not possible to swim and in some time the lakes will turn into muddy swamps

Government has invited people to clean the lake and will pay 100 € per day for this work. The first day is successful, one person will fulfill 10 trash bags during the working time. The next day is harder. The big trash has been taken out and the same person can fulfill only 5 bags for the same money. The third day is even worse, only one bag is filled because there is only tiny trash and it takes time to take it out. Still the wage is the same. The lake is already so clean that fishes can live and the ecosystem will survive. But the lake is not absolutely clean, and environmental activists demand continuing the cleaning process. As there are many people who clean the lake, the government spends a lot of money. Now the government has to make a decision: to continue or to use the same money for other lakes, education, welfare of the poor, etc.

Divide the class into small groups and give them about 15 minutes to discuss with each other and make the common decision per group. Then join the class again and let each group make a

presentation about what they have decided and why. Reasoning is more important than the decision here.

3. Externalities

By Elbe Metsatalu (JA Estonia)

LESSON DESCRIPTION

Students will identify some third side effects of some business and work in pairs to analyze the situations with positive and negative externalities and offer the approach to solving the problems and how government policies are designed to correct the negative externalities and support the positive externalities.

AGE LEVEL: High school, 16-18 years old

TIME REQUIRED: 60 min

CONCEPTS: Negative externalities, positive externalities, role of government

BENCHMARKS

Externalities exist when some of the costs and benefits associated with production and consumption falls on someone other than the producers or consumers of the product.

Governments provide an alternative method to markets for supplying goods and services when it appears that the benefits to society of doing so outweigh the costs to society. Not all individuals will bear the same costs or share the same benefits of those policies.

OBJECTIVES

1. Students will define and give examples of negative and positive externalities.
2. Students will explain how private market activities can cause externalities.
3. Students will analyze and evaluate the role of the government in correcting externalities.

Now give students pairs of cards with environmental problems and its results, and ask them to offer solutions. Print reasons and results on different colors. First ask them to match two cards

and then offer a solution. The last column in this table is for helping the teacher (Don-t print to students!)

ENVIRONMENTAL PROBLEMS: POSSIBLE REASONS, RESULTS and POSSIBLE SOLUTIONS

REASON	RESULT	SOLUTION (example)
Textbooks get out of date	Too much paper waste	Gather paper waste and take it for recycling. More on-line learning materials
People use cars for going to work	Air pollution	Organize well functioning public transportations using electricity . Promote cycling.
Lake is polluted	Less fish	Find reasons, directives for finishing pollution, order to polluters to clean the lake and build sewage treatment equipment
Fertilizers have seeped into the river water from the fields	Aquatic plants grow in rivers, and when they decay, they reduce the oxygen in the water	Fertilize less and only with the sowing of plants, plant forest strips along the river, which prevent fertilizers from seeping into the river
Littering from car windows	The roadsides have turned into garbage dumps	Place trash cans along the roads.
Humans use more and more fuels	Global warming	Instead of fuels use renewable or inexhaustible forms of energy that do not emit harmful gasses into the air

Dripping water faucet at home	A large amount of clean water flows uselessly down the drain	Repair water taps and pipes, refrain from excessive water consumption.
Forests are cut down for timber production	Wildlife habitats and rare plant habitats are being destroyed	Prohibit logging in rare natural communities, plant new forests
Purchases are packed in multiple packaging	Garbage dumps around cities are increasing	Give up as much packaging as possible and use paper packaging. Use cloth and paper bags instead of plastic.
Mineral resources are extracted from quarries	Large depressions and stone hills appear on landscapes	After mining, fill and level the ground, reduce mining quantities.
Oil gets into the sea from ships and ports	Seabirds, fish and seals die, beaches are polluted	Avoid pollution, meet safety requirements, build proper oil quays in ports
Artificial preservatives are added to foods	More people with food allergies	Produce organic products whose raw materials are obtained from pure nature and grown without fertilizers and poisons

On-line version

Let students to do the same on-line. Divide them into pairs and each pair will get their own on-line room for discussion. They can also discuss their task in Messenger or any other platform they prefer.

First give them the list of reasons in a random order and another list of results. Ask them to make a match and then think out some solutions for each pair. It may take about 20 minutes. Students are encouraged to use internet for finding solutions. Then invite them together again and ask different pairs to explain one reason-result pair and offer their solutions. As students do not know which pair they have to present, they must work on all problems. After each presentation other students can raise their hand and add their solutions. This can take about 60 minutes.

FINDING NEW IDEAS

4. Entrepreneurs of Future

Step 1. Participants write individually how they imagine their life environment in 20 years. They describe how our nature has changed, about fashion, technical environment, lifestyle of people, traveling, work environment, living conditions, standard of living, people's life expectancy, etc. (5-10 minutes)

Step 2. Participants work in pairs and combine their descriptions together into one logical one. (5 minutes)

Step 3. Participants work in groups of 4-6 people and write one description about their future environment based on the two descriptions (made in pairs) - 10 minutes.

Step 4, Groups think out one product or service that fits into their imaginary environment and describe it. Various brainstorm methods can be used. (25-35 minutes, depending on the brainstorm method, for thinking, 4-5 minutes for presentations per group)

Feedback from the facilitators 10 minutes

On-line version

It is easy to take this activity on-line. The time schedule remains the same. Give the task to students and let them work alone. Then they need different rooms for working in pairs and then two pairs are joined into one. For the next task you can visit the groups or invite them together to the big room again. Presentations are made in the big room at the end. They can draw their products and show them to others.

5. Green Creativity Brainstorm

Step 1. Ask your students to form teams of 3-5 persons. Give them three large problem fields about green entrepreneurship, for example

- a. Waste management at home
- b. Traffic pollution
- c. Energy

Let them choose one and write down all specific problems that they can find in this field. (Ordinary brainstorm principles are valid) – 10 minutes

Now ask them to choose one. (3-5 minutes)

Step 2. Determine all groups of people who are involved in this problem and make a list of them

Step 3. Ask them to brainstorm for solutions, i.e. PRODUCTS or SERVICES (again, ordinary principles are valid) (10 minutes) and then point out one.

Step 4. Students draw a prototype (10 minutes)

Step 5. Let them decide who your customer is (they have to go back to step 2 and make their choice). They have to describe the target group as specifically as possible. It is their Avantar. They can draw the picture about their best customer and name him or her.

Step 6. They will make a list of problems this target group can have when using their product. Think how to solve them.

Step 7. Ask students to go to the street and try to find somebody from their target group and tell him/her about their product to get their opinion.

Step 8. Ask them to make amendments and build a prototype.

Step 9. The last step is to make a presentation to others

On-line version:

Here Tricider method can be used (see below) for all steps of the brainstorm but also it can be done in different virtual rooms where student teams list their ideas, discuss them and choose the best ones. During step 7 ask students to show the drawing of their product on-line to their contacts using Instagram, Facebook, and other channels that they use daily. For the last step everybody returns to the big virtual room and all teams make their presentations to everybody.

6. Brainstorm with LEGO blocks

It can be done separately for finding an idea and also only for building a prototype for the previous brainstorms as then students see that no material is wasted even for their brainstorms.

Experience says that LEGO blocks release creativity from people and it is easy to think about the future with LEGOs (build from LEGOs your future nature, etc.) but also use them for solving problems (build a tool for cleaning seas, air, planning a green city, etc.). When building their prototype it is possible to start with individual work, then look at each other's' work and build together one group solution. It is also possible to start building the group work together already from the very beginning.

On-line version is not possible.

Instead of LEGOs drawings may be used but it does not give such kind of release of a free idea storm as LEGOs do.

7. Brainstorming Map

This activity is good for involving all participants into the ideation process and allows those youngsters who are not willing to speak up also express their ideas.

Students can work in the groups consisting of 2, 3 or 4 persons. Each person has to choose one marker: Blue, Red, Black or Green. According to the colors each student has now a special task during the brainstorm.

Red: pushes participants, encourages success and monitors the outcomes

Blue: makes sure that the group has all necessary equipment to finish the assignment

Black: keeps an eye on the clock and suggests solutions as the groupwork goes along

Green: makes sure that everybody has a voice and that every person contributes.

Blue picks up a flipchart paper (Mat). Now the Mat has to be divided in the following way depending on the number of people: 1) for four persons (the best – each can have one marker), 2) for three persons (do not give out Blue marker) and 3) for two persons (both get two markers). Each student gets one side to write down his or her ideas. The decisions of the group will be written into the middle when the ideation period is over.



Give students a green entrepreneurial problem for solving, for example **What product can help people to sort their garbage more easily?**

Step 1. Individual work (5 minutes). Students write down all their ideas on their part of paper. Nobody speaks.

Step 2. (4*2, 3*2 or 2*2 minutes) Each group member explains what they have written down.

Step 3. (5 minutes) Together they choose 3-4 ideas and write them into the center of the paper. Sometimes here the ideas can change getting input from other members.

Step 4. (10 minutes) Students share their findings. One group member tells others about one suggestion. It is important not to repeat what other groups have said.

On-line version

Here different virtual environments can be used for the virtual version, most common are TEAMS and Zoom in schools. All the questions remain the same but markers cannot be used. Instead, ask students to type their ideas with different colors. Students have to work in groups of four, three or two. As markers are not used, the one who has picked blue color is the one who will present the idea to other groups.

The design of Mats has to be drawn before (using help of other teachers or even students if necessary) or give students more time to learn how to do it (integration of different subjects). Help from other teachers is welcome here.

8. Cooperation with green or blue enterprises

Take your students to the businesses that are focused on green or blue (dealing with environmental problems related to sea) entrepreneurship. There they can learn about the problems and see some solutions to them. As people working there are usually really enthusiastic they are almost always anxious to help students not only in finding their ideas but through the whole process of their entrepreneurial studies. Very often they also have scientific backgrounds so that students can take their ideas to a higher level than working alone with their teachers.

On-line version

If real visits to green or blue companies are not possible those can be replaced with virtual visits. Students research the webpages of green and blue companies, find out their mission, values, main principles of activities, their social responsibility, products and services, etc. They send an email or call to the company and ask their managers or specialists to meet them in Teams or Zoom where they can speak about their company, demonstrate their products, answer students' questions and give them advice. If students are involved in the Company Programme, students can ask them to become their green or blue volunteering mentors.

GREEN ANALYSIS OF IDEAS

9. Green Analysis of an idea

When students have found their idea (not important if it is an ordinary product or something that is meant to improve the environmental situation), ask them to sit down with their team, think and write into the

Step 1. IMPACT WINDOW

Positive impacts of our idea on environment (open list, the more the better)	Negative impacts of our idea on environment (Open list, the more than better)
Neutral impacts of our idea on environment	We are not able to evaluate the impact (yet)

Step 2. Weighting the impact. For this they analyze the upper side of the window and put the weights (grades of importance) to all your points (10 is maximum, 0 minimum)

Add the weights in both boxes and find out which side has more impact.

On-line version

This activity can be taken into on-line sessions without any problems. Students can work in groups, fulfill the table, discuss these items together, weigh the impact of their list and make presentations to the group and to their teacher.

10. Tricider

On-line activity

Go to <https://www.tricider.com/>. You can open your account but it is possible to use it also without doing it. The free version enables to make very good anonymous brainstorming that fits well for more introverted or shy students, but it is an excellent tool also for analyzing ideas.

Example:

The screenshot shows the Tricider interface for a brainstorming session titled "How to decrease the usage of plastic bottles". The session has 14 days left. The interface is divided into three columns: Ideas, Pros and cons, and Votes. There are three ideas listed:

Ideas	Pros and cons	Votes
Go shopping with your own bottle or bar by Teddy	Customer safety is not guaranteed (not clean bottles) by Freddy Ecofriendly, no need to produce new bottles by Teddy Add argument	2 Vote Minnny Teddy
Use glass bottles by Freddy	It means reusing the same bottles and people can choose themselves how big the bottles are. by Minny Add argument	0 Vote
Wash and reuse the bottles several times by Minny	<input type="text" value="The argument"/> <input type="text" value="Epp Vodja"/> <input type="button" value="Save"/> <input type="button" value="Cancel"/>	0 Vote

Here students can analyze all their ideas on-line. If teacher prefers, he/she can allow students also to use nicknames to get more honest answers. Of course, there is some risk in it.

When it is time for choosing the idea, each student has only one vote, except the one who created the tricision.

Classroom version

It is possible to organize this activity also in the classroom and even with a big class. Divide students into teams and these team members may sit randomly anywhere in the classroom. One member of the team is chosen to become the team leader (the teacher can do it also) and she/he must have the emails of all her/his group members. Explain to the leader before the lesson that she/he is going to create the tricider activity but you will give the topic for discussion. Then the leader sends an invitation to the group members' emails and the activity starts. The advantage is that now the brainstorm is anonymous and shy students can express themselves more freely.

RESOURCES

11. Generations

This activity explores the effect of consumption of non-renewable resources on future generations.

Have a large bag of candies for each group of twelve participants. Put about half the candies in one paper bag and half into another—however, put no one kind of candies (“brown” ones) in the second bag. Make a set of index cards with two of each for the following roles: grandchildren, children, parents, grandparents, great-grandparents and great-great-grandparents. Divide the roles between participants so that each generation will have 2 members. If you have more participants, form a group of 3 people for great-great grandparents and grandparents and pairs for children.

To begin discussing the difference between renewable and nonrenewable resources that humans rely on for survival. Next, explain that the candies in the first bag represent those resources humans need to survive. And don't forget to say that the amount of candies that they take describes their living standard – the more the better they live. Now the game starts.

- Tell the great-great grandparents to take as many candies (i.e., resources) as they want without looking in the bag—but not to eat them until the end of the game.
- Have each generation pass the bag to the next younger generation, each taking as many as they want, until each generation has had a turn, or the bag is empty. It is possible that some participants will not get any candies. If that happens, don't worry! (Remember you have a second bag full of “renewables” in reserve.) Ask “What would happen to the next generation to be born if the bag is empty?”
- After discussing the ramifications of running out of resources (i.e., candies), explain that “brown” candies are non-renewable and the other colors renewable, and that to stay in the game, a player must have at least one brown candy.
- Explain that to acquire more candies participants can trade with each other at whatever exchange rate they agree upon.

Allow several minutes to pass as trades are conducted.

- At the end of trading, participants without any brown candies are eliminated (they get to keep their pile candies) unless a generation before them wills them an inheritance that include brown candies.
- Offer to trade with the remaining players (from the reserve bag of candies) at a fixed exchange rate of 1 brown for 4 of any other color.
- After trading any player without brown candies is eliminated (they get to keep their pile of candies). This concludes the “game” portion of the activity.

Continue by discussing which type of trading the participants preferred—unregulated or fixed rate.

Then discuss the value of the brown candies or non-renewable resources. [Historically, metals and gemstones have had the greatest value, while coal and oil were less valuable.] Follow up with a discussion of leaving an inheritance for future generations.

Lastly, ask participants, “*What is the value of clean air and fresh water?*”

Share the remaining candies with the group and enjoy.

No on-line version of this activity

This can be replaced by the following similar activity.

12. Ancestral Heritage.

Give students a list of typical needs and wants. Do not tell them yet that these numbers demonstrate the resources needed to satisfy their needs. They must estimate on which level of the scale they want to be, it is the living standard that they choose.

Scale is from 1 (only the basic needs) to 30 (luxury, all comforts and the highest choice and quality).

They can choose any number from 1 to 30 or 1-10.

- **Housing** (the scale 1– 30)
- **Food** (1-30)
- **Clothing** (1-30)
- **Transportation** (1-30)
- **Traveling** (1-30)
- **Entertainment** (1-10)
- **Health** (1-10)
- **Hygiene and cosmetics** (1-10)
- **Communication** (1-10)
- **Pets** (0-10)

Divide students into groups of 5 people (Great grandparents, Grandparents, Parents, Children, Grandchildren). If the number cannot be divided to 5, add one person to Great grandparents, then one to Grandparents, and one to parents. If one is still odd, add 2 great grandparents.

All students in groups write down their decisions. Maximum is 200 for one person. Ask them to add the numbers of one group together (maximum 1000 per 5 students, 1200 per 6 student group, etc.) and say that you have non-renewable resources only for 500 points (you may change this number). If ancestors have used all of them nothing is left for children and grandchildren and there is a great tragedy. Now give them other 5 minutes to rethink about their needs and make a new calculation.

Discuss the current situation and the need to economize, give up some of their wishes and make a difference between a want and a need for maintaining important resources also for the future generations.

13. Using forests

Overusing forests is a problem that is widely discussed. Timber is a renewable material and very often it is said that timber can replace plastic in many places. Still cutting trees has also a huge impact on our environment if it is done abruptly, too actively, in sensitive places and without clever strategy. Tell students that they are going to work in groups and discuss what kind of using forests has to go on and what has to be ended. They have to think about forest as a resource, about entrepreneurship, users' needs, and about the environment.

Divide students into groups of 4-6 persons. They all get a set of cards with a description of one use of forest on each. The fields of use are: Paper Industry, Timber as a building material, Grazing, Medicine Industry, Charcoal, Firewood.

Students read the descriptions and then make a row from the cards so that the field of use that has to go on for sure (the most important one) will be at one end and the one that can be finished or used much less is in the other end. For this they may need about 15 minutes as they have to read the information and then discuss with each other what to do.

When they have finished, each group makes their presentation and then they will decide as a whole class which activities are definitely needed and which ones can be replaced with other materials to keep our environment healthy.

Descriptions on the cards

Paper	Timber
<ul style="list-style-type: none"> • Loss of forests, risk of extinction of species. • Air, water, land pollution • Paper recycling - also pollution - from ink liberation. • However, 35% less water pollution and 74% less air pollution than in new paper production. Fewer 	<ul style="list-style-type: none"> • Lowest embodied energy as a building material. • Logging has environmental impact. • Clearcutting - harmful impact of wind and rain; destroys valuable wildlife; and causes soil to become dry and overheated - increases the

<p>landfills - 1 ton of recycling - 3 m2 less landfills</p> <ul style="list-style-type: none"> • During decomposition – methane, greenhouse gasses. <p>Additional information: Every year 4 billion trees are cut for the paper industry in the world.</p> <p>For the Sunday edition of the New York Times – 400 ha of forest <u>is cut</u>.</p>	<p>risk of fire or interfere with seedling growth.</p> <p>Additional information: Forecast: demand is increasing about 30% per cent in 10 years.</p>
<p>Grazing</p> <ul style="list-style-type: none"> • Bringing in new species for hunting, removal of top predators (wolves, etc.). • Fire-tolerant species of trees have been replaced with fire-sensitive ones. – Fires that cause dry wastelands. • Grazing cattle reduces plants that outcompete tree seedlings • increasing tree density, • greater vulnerability to insects and pathogens, • more intense wildfires. • Damages forest soils and streams, and contaminates waterways with fecal waste. • Affects negatively biodiversity. <p>Additional information: Large plant eating animals have been a natural part of landscapes. Happy cattle living outside.</p>	<p>Charcoal</p> <ul style="list-style-type: none"> • Earlier – one of the main reasons of deforestation. Now – more results in natural degradation. • Producing high quality charcoal - global warming through the production and emission of greenhouse gasses (carbon dioxide (CO2), methane (CH4)). • Byproducts of making charcoal - , methane, hydrogen, and tar – can be allowed to escape as gasses and other volatiles in the smoke <p>Additional information: More and more byproducts are recaptured, condensed, and converted to useful byproducts.</p> <p>In tropical ecosystems charcoal production and use can significantly contribute to poverty reduction and environmental sustainability by providing energy in accordance with sustainable development goals.</p>
<p>Medicine</p> <ul style="list-style-type: none"> • Extracts of many forest plants are used as the basis of modern drugs. • 19 North American medicinal native plants as “at risk” and an additional 22 plant species make the “to watch” list. <p>Reasons:</p> <ul style="list-style-type: none"> • habitat destruction, • bioprospecting, 	<p>Firewood</p> <p>Smoke (fine particles, but also toxic air pollutants</p> <ul style="list-style-type: none"> - health problems, - smog, - acid rain, etc. <p>Open fireplaces – the most pollution. Wood pellets (dramatic increase) – often good quality wood, but also leftovers of sawmills (branches, saw dust), etc.</p>

<ul style="list-style-type: none"> • biopiracy, • overharvesting. <p>Additional information: About two-thirds of the top 150 prescription drugs are based on natural sources. Also traditional medicine is based on them.</p>	<p>Additional information: Approximately one-third of the world’s population relies on firewood for heating and cooking.</p>
<p>SPORT AND RECREATION</p> <ul style="list-style-type: none"> • Soil erosion and compaction • Damage to vegetation • Littering • Disturbing wildlife • Water pollution • Forest fires • Vandalism • Noise <p>Additional information: Happiness increases Better health (physical activities, D-vitamine, bodyweight decreases, etc.) The people’s livelihood Learning about nature</p>	

NB! There are no absolutely right or wrong answers. Everything depends on reasoning.

On-line version

This activity can be transformed into a virtual version very easily. Simply use separate virtual rooms for teams and the one big one for presentations.

MANAGEMENT AND PRODUCTION

14. Green Marshmallow Challenge

Marshmallow Challenge is a well-known exercise for teaching creativity and entrepreneurship. In the Green Creativity project we have taken the standard Marshmallow exercise as a basis and added the green aspect – using less resources.

Short summary

The marshmallow challenge is a simple **design exercise** and team-building activity for small groups.

The groups have to **build the tallest free-standing structure** from some **spaghetti** sticks and tape and place one whole marshmallow on the top. Running the challenge requires 18 minutes.

The exercise teaches essential **lessons about the creative product development process** and the nature of collaboration.

The **rules are easy**; in 18 minutes, each group can use 20 sticks of spaghetti, one meter of adhesive tape, and one marshmallow to build the tallest free-standing structure with the entire marshmallow on the top.

In our green game we have added, that height is not the only criteria for winning the competition. Also efficient use of materials will be taken into account. When the building is ready, it is measured and **each spaghetti used will reduce their result in one cm and two centimeters of tape will do the same**. So they are encourage to build as possible with so small amount of resources as possible. A **Marshmallow is considered to be a renewable resource and does not cost anything**.

The teams can break the spaghetti and cut the tape any sized pieces.

The exercise should be done indoors, and each team should have a steady table.

This challenge needs to be **friendly and encouraging**. However, the following three instructions need to be strictly respected.

- 1) Entire Marshmallow has to be used. It mustn't be split into smaller pieces and must be placed on the top of the structure.
- 2) The structure has to be free standing.

The groups can hold the structure until the end of the exercise. After that, the structure **with the marshmallow on the top must stand on its own**. The team with the tallest built structure measured with the smallest amount of resources is the **winning team**. (Height – number of spaghettis – cm-s of tape)

- 3) Building has to stop when the time runs out.

The exercise is 18 minutes long. Therefore, the teams **must stop working on their structure at the 18-minute mark**.

After the building activity the discussion has to focus on why these conditions about using less resources are added. Why it is important to keep quality and achieve our goals, but still act in an environmentally friendly way?

No on-line version for this activity.

15. Green Card Game

This game is traditionally about leadership, communication and vision. For the Green Creativity project we added green entrepreneurship aspects throughout the whole business process. The main principles of the game will stay the same as they are in the traditional communication game. Change is made in the cards used for the game. Usually it is played by ordinary playing cards with King, Queen, Soldier, etc. These cards are replaced with different aspects of green entrepreneurship.

A minimum of 5 players can play one game. It is recommended to play with 7-9 people. In the Green Card Game we cannot have more participants than 9.

First, the CEO and two deputies (Middle Managers) are appointed. The rest are simply Employees who report to the middle managers. There could be 2-3 employees per a middle manager. With a large number of players, it is worth thinking about making two groups.

Have the players sit behind each other like in a classroom. The CEO sits in front of everybody, two Middle Managers (his/her Deputies) sit behind the CEO. Behind them the Employees take their seats, divided into two departments. Half of them sit behind one Middle Manager, another half behind another.

You tell them that they have a task to complete and all the information that the players need is in their envelopes. You do not say that the envelopes have different information for each level. Besides the information they also have four cards in the envelope, preferably different (Check to make sets of four cards). Players (except the CEO) initially do not know that they have to collect four similar cards (originally four aces, kings, etc.) – in green game four Marketing, Four Production or four other stages of business. They collect them by changing cards with others.

Only CEO knows what is the goal of the game, but she/he does not know that others do not have this information.

Give the players small pieces of paper – you can cut A4 into 8 pieces (reuse the paper that has already something printed on one side). You tell the players that they are not allowed to talk to each other, all information must be transmitted only in writing. Letters can only be exchanged up and down the direct hierarchy ladder. The two Middle Managers are not allowed to communicate with each other, they do it only through the CEO. Nor are the workers allowed to communicate with each other, they do it through their direct boss – their Middle Manager.

Look how long it takes for all the team to have four similar cards.

When the goal is achieved start a discussion about what happened. Why was it difficult to fulfill the task? Usually they say that they did not know what to do. Let them to explain how they still got things going. Emphasize what happens if only the leader has the VISION and she/he expects others to share the same one, but others even do not know the leaders vision. Does it motivate them to work hard?

When you have finished discussing the leadership part of the game start with the environmental aspect. Ask students what is written to the cards and why it is important. Let everybody read the text loud and comment it. Students may want to argue that some of these activities are not possible, etc. Let others explain them why it is important for businesses to start thinking and acting environmentally friendly.

If you have less than 9 persons playing, you have to decide, which field on business activities exclude from the game. There must be as many fields as there are players, so that everybody can collect one type of cards.

TEXTS in the envelopes (individual instructions)

CEO (1 copy per game)

You are a CEO in an environmentally minded company. You have two Middle Managers who report to you, and both of them have Employees who report to them.

Everybody has four random cards. The goal of the game is that everybody has four cards which express the green activities of one field (e.g. Marketing, Production, etc.) at the end of the game.

You may communicate ONLY by written messages only with your Middle Managers, who may communicate in written only with you and with their Employee(s). Middle Managers are allowed to communicate with each other only through you.

You must get back as many cards at once as you give away, and vice versa. So you must have four cards all the time.

Good luck!

Middle Manager (2 copies per game)

You are a Middle Manager.

You have Employee(s) who report(s) to you. Everybody has four cards.

You are allowed to communicate with your CEO and Employees only in written. You may change cards with your CEO and also with your Employees. You must get back as many cards at once as you give away, and vice versa. So you must have four cards all the time.

Good luck!

Employee (all the others, but not more than 6 in the green game)

You are an Employee.

Everybody has four cards.

You are allowed to communicate only with your direct boss (Middle Manager) only in written. You may change cards only with him/her. You must get back as many cards at once as you give away, and vice versa. So you must have four cards all the time.

Good luck!

Green Cards for the game

<p>Resources</p> <p>Local</p> 	<p>Production</p> <p>Material efficient</p> 	<p>Transport</p> <p>Electric vehicle</p> 
<p>Resources</p> <p>Residuals from other companies</p> 	<p>Production</p> <p>Waste free</p> 	<p>Transport</p> <p>Big deliveries</p> 
<p>Resources</p> <p>Recycling</p> 	<p>Production</p> <p>Energy efficient</p> 	<p>Transport</p> <p>Short distances</p> 

Resources

Biodegradable



Production

Water efficient



Transport

Optimized trips



Packaging

Naked package



Production waste

Biodegradable



Marketing

No plastic ads



Packaging

Reuse



Production waste

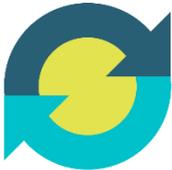
Zero waste



Marketing

No or few printed materials



<p>Packaging</p> <p>Biodegradable</p> 	<p>Production waste</p> <p>Recyclable</p> 	<p>Marketing</p> <p>Sustainable on-line marketing</p> 
<p>Packaging</p> <p>Minimal packaging</p> 	<p>Production waste</p> <p>Used for other products</p> 	<p>Marketing</p> <p>No promotional gifts</p> 
<p>Office</p> <p>Paper free</p> 	<p>Product</p> <p>Repairable</p> 	<p>Selling</p> <p>Not aggressive, too active</p> 

<p>Office Garbage sorting</p> 	<p>Product Long lifetime</p> 	<p>Selling No false arguments</p> 
<p>Office Reasonable use of electricity</p> 	<p>Product Environmentally friendly</p> 	<p>Selling Addressed to the real target group</p> 
<p>Office Remote work</p> 	<p>Product Satisfies a real need</p> 	<p>Selling Promoting green lifestyle</p> 

On-line version

This game is not an easy one to organize but can still be fun and educating also on-line. Students must be divided similarly to the classroom game into groups from 5-9. They must have different virtual rooms or even better, different Zoom or Teams groups. All students get their personal

information here through different channels, probably students may prefer Messenger or something like this. And they will communicate also in written form as in an original game. They have to keep a short table of their cards. When a student wants to change a card, she/he writes to the letter for example “I am sending you an OFFICE card with the text "Remote work" and the one with whom the communication goes answers “ I am sending you a card with the text Marketing “No promotional gifts”. They mark down into their notes which cards they have any moment, making changes each time when they change the card. Everything else stays the same as it is in the classroom game. The CEO announces the teacher when they have finished. The teacher is visiting all the groups randomly seeing what is going on during the process. When the game is over, the class gathers and they will discuss everything that is written on the cards.

TRANSPORTATION AND LOGISTICS

For turning entrepreneurship studies more environmentally friendly it is necessary to speak about optimizing transportation and logistics of goods and services. Very often this optimization can be useful also for the company as transportation costs fall and time saved can be remarkable. The Green Creativity project adapted a Ball Game that was initially meant for teaching planning as a part of management and also for demonstrating the use of optimization and planning to green entrepreneurship.

15. Green Ball Game

It is good to play it with at least three groups (approximately 7-10 members). Each group gets a ball.

Task: to keep the ball moving so that one person touches it once at a time and it is touched by one person at a time. The ball must start and finish moving in the same place. The ball cannot be given to a person by your side (right, left, back or in front of you) – to your closest person.

The quickest team wins! Three minutes are given for planning.

When the team has finished, somebody calls: DONE! The time has to be written down!

Now one more minute is given for thinking and then the game is repeated. Was there any difference?

Now give the task to do the same with three balls. 2 minutes for thinking. What was the time?

Now with six balls. 2 minutes for thinking. What was the result?

Explain the process: PLAN - ACT – REVIEW – CONCLUDE – PLAN

When the game is over, discuss with students why it is played in the lesson of green creativity in business. The answer is: all groups who were successful cut the distance their ball had to pass through. It was useful for nature but also for business. It happens that even six balls go through the hands of all people quicker than the first ball did and it is only due to optimization of the process. Discuss with students how it is possible to cut the distances from where your materials come or where you send your products. If it is not possible to do it, how is it possible to make transportation more eco-friendly?

No on-line version for this activity.

GREEN MARKETING

It was not possible to find any environmentally friendly marketing activity from internet. So we have composed one ourselves relying on commonly known 4 P-s of marketing.

16. Four Green P-s of Marketing

If students have not studied marketing before give them a short introduction into 4 P-s of marketing: Product, Price, Place and Promotion.

Four Green P-s of Marketing are focusing on not adding waste by marketing activities and directing customers to buy more eco friendly products.

Here Brainstorming is again a good method. To learn something new and use IT in the classroom (or deliver the lesson on-line) you can use the platform of **Tricider** <https://www.tricider.com/>

The free option enables us to make very good anonymous brainstorms that fit well for more introverted or shy students.

Which is higher? Why? Pros and Cons of the higher price

Is it possible to make people buy eco-friendly products if they are more expensive?

What to do?

Lifecycle of the product –(if they do not speak about it themselves, explain that if the lifecycle is longer, price can be higher)

To buy materials in bulk (cheaper) or less (less waste) What to do and how to decide?

- **Place**

Where to sell? What are the environmental advantages of selling directly to the customer?

How long is the selling chain?

Where are your customers? Transport distances: What to do to reduce them? Again: You may want to use Tricider for answering to the questions!

- **Promotion:**

How to make your promotion more eco friendly?

On-line marketing – pros and cons

Analyze of marketing materials

Reuse of posters

What material do you use for promotional posters and roll-ups? Are they really necessary?

What is the content of your slogans? And what is the goal?

Decoration of the selling stand – materials? Messages?

What happens with your marketing materials after their usage? Is recycling possible?

Do you want everybody to buy or people who really need and use your product?

Do you inform customers about the results of their purchasing choices?

Analyze the impact of your whole marketing activities to the environment!

On-line version

The suggestion was given already in the classroom game to use Tricider but this activity can take place also in Zoom or Teams rooms where students work in different virtual rooms and get together for discussions.

ACTIVITIES FOR REPEATING WHAT STUDENTS HAVE LEARNED ABOUT GREEN ENTREPRENEURSHIP

17. An All-Inclusive Quiz

This is a fun activity for repeating what students have learned during their studies about green entrepreneurship. No grades are given but everything can be discussed through once more. Some questions are added that can be used but every teacher is welcomed to create their own quiz to make the activity more useful and interesting.

Divide your class into two equal groups. If the number of students is odd, ask somebody to come to help you with counting the points.

Explain the rules. When you have asked the question, students who know the answer, stand up. The group whose member was the first one to stand up, gets the right to answer. But – it is not sure that the first one who obtained the right for the group to answer will be the one to do it. The teacher selects randomly one student from this group who stands to give the answer. If the answer is correct the group gets so many points as many students stood up. If the answer is wrong, they get as many minuses.

Students are not allowed to speak with each other. They have to decide silently to take the risk or not if persons are not sure that they know the correct answer. It is like business works: who takes the risk, can get more profit, but can also lose a lot!

Green side here are only the questions, but this method works well. Sometimes you have to explain the answers once more.

Some examples of the questions:

- Give an example of greenwashing
- What is a Naked package? (answer: selling without any package)
- What is a circular economy?
- Which day is called Earth Day? (answer the 22nd of April)
- From which country World Cleanup Day started?
- Name three non-renewable resources

- Which country comes first in contribution to the most domestic waste per person?
(Answer U.S.)

On-line version

The same method can be used on-line, but probably it is then easier to divide students into two groups in an alphabetic order. For answering students have to raise their hands and the teacher has to be extremely attentive to notice who is the first one to do it. The teacher chooses one student from the same group (beginning or end of the alphabet) to give the answer. It may take a bit more time than the classroom version but it is possible to do it. The first time will be a bit complicated but experience and a good training helps a teacher a lot.

18. Tic Tac Toe

This is another option for repeating what students have learned. Again, the group has to be divided into two teams but students can play it also in pairs.

1	2	3
4	5	6
7	8	9

Here you need nine questions and you have to number them. You have also numbered squares in your Tic Tac Toe table.

The first team will choose a number to which square's question they want to answer. If the answer is correct, write the x or o (what they have decided to have) into this square. If the answer is wrong, the other team will answer (and get their symbol to the square if the answer is correct). Then they choose their square. Who will fulfill the squares so that it is possible to draw a straight line, is the winner.

Again, the only environmental aspect here are the questions about green business. And after answering you are the one to make comments or start discussions at the end of the game. Students like this kind of activity much more than tests and ordinary repeating. And it really works!

The on-line version

It is easier to play the on-line version in pairs. Teacher will ask the question and the students will answer in pairs and they will tell their results to the teacher when the game is over. After that a good discussion about the right answers will be a great help for repeating.

19. Kahoot

Of course you can always use Kahoot for repeating. A great tool when you make comments to the right and wrong answers. It can be played in the classroom but also during the virtual lessons! But be careful, do not turn it into a competition only, repeating and explaining is the most important part of this process.

Thank you for reading! If you want to add anything, think out more environmental activities.

We would be happy to get your comments and games also!

**Your NordPlus Horizontal project Green Creativity for Teachers of
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