

Global Learning Unit

AUTHOR:	Institute for sustainable development
COUNTRY:	Slovenia
TITLE:	Seeds – basic concepts and trading
STUDENTS' AGE:	11-17 years old
SUBJECTS:	Natural Sciences, Geography, Biology
DURATION:	3 school hours (3 x 45 min)
TOPICS	Seeds Right to food Sustainable agriculture GMOs
SDGS	Zero hunger

Knowledge and understanding on Global Learning:

Social justice and equity	Fairness between groups	Inequalities within and between societies	Causes of poverty	Understanding of global debate
	Causes and effects of inequality	Basic rights and responsibilities	Different views on eradication of inequalities	
Globalisation and interdependence	Trade between countries	Awareness of interdependency	Power relationship North/South world economic and political systems	Complexity of the global issues
	Fair trade	Awareness of our political system and others	Ethical consumerism/ consumption	
Sustainable development	Relationship between people and environment	Different views of economic and social developments - locally and globally	Global imperative of sustainable development	Understanding of key issues of sustainable development
	Awareness of finite resources	Understanding the concepts of possible and preferable futures	Lifestyles for a sustainable world	
Diversity	Contribution of different cultures, values and beliefs o our lives	Nature of prejudice and ways to combat it	Understanding of issues of diversity	Deeper understanding of different cultures and societies



Skills and competences on Global Learning

Critical thinking	Detecting bias, stereotypes and opinions	Media literacy	Critical analysis information	Handling contentious and complex issues
	Assessing different viewpoints	Making informed decision	Making ethical decisions	Dealing with complexity and dilemmas
Ability to argue effectively	Finding and selecting evidence	Learning to develop/change position through reasoned argument	Arguing rationally and persuasively from informed position	Political literacy
	Beginning to present a reasoned case	Participation in relevant societal and political processes	Connect local and global context & experiences	
Cooperation and conflict resolution	Accepting and acting on group decision	negotiation	compromising	mediation

Values and attitudes on Global Learning

Empathy and sense of common humanity	Sense of importance of individual worth	Open-mindedness		
Commitment to social justice and equity	Growing interest in world events	Concern for injustice and inequality	Commitment to social justice and equity	Commitment to the eradication of poverty
	Sense of justice	Willingness to take action against inequality	Integrity	Solidarity
Concern for the environment and to sustainable development	Sense of responsibility for the environment and the use of resources	Concern about the effect of our lifestyles on people and the environment	Concern for the future of the planet and future generations	Commitment to sustainable development
Belief that people can make a difference	Belief that things can be better and that individuals can make a difference	Willingness to take a stand on global issues	Willingness to work toward a more equitable future	Role as Global Citizen
Respect for people and things	Making choices and recognizing the consequences of choices	Growing ability to take care of things	Following a personal lifestyle for a sustainable world	
Ability to challenge injustice and inequalities	Recognizing and learning about alternatives to mainstream	Starting to challenge viewpoints which perpetuate inequalities	Selecting appropriate action to take against inequality	Campaigning for a more just and equitable world



European lifelong learning key competencies

1. communication in the mother tongue
2. communication in foreign languages
3. social and civic competences
4. cultural awareness and expression

Learning objectives:

- Become aware about the importance of seeds from perspective of nutrition, self sufficiency and trade.
- Understand that climate and soil conditions vary around the world and become aware that the plants (crops and others) adapted to these diverse conditions.
- Learn to recognize the labels on seed packages and to know what they mean.
- Become able to distinguish between organic, indigenous, treated, hybrid and genetically modified seeds.
- Learn which kinds of seeds are most appropriate for self sufficiency in food.
- Become aware of the role of large multinational companies in the production of seeds and learn about the consequences of farmers' dependency on an annual purchase of those seeds and consequently about the problem of global trade in seeds.
- Become aware of what are the global consequences of purchasing hybrid or GM seeds.
- Recognize that they can, as active citizens, encourage sustainable development of the planet.

Methodologies:

Use of educational films, work in groups, brainstorming, assignment to outline portions of article, mind map, making of mind map posters.

Activities:

Lesson	Time	Activity description	Tips for teachers
1	5 min	<p>For the introduction teacher using questions such as:</p> <ul style="list-style-type: none"> ▪ »what is seed?«, ▪ »how is it composed?«, ▪ »what is the function of a germ?«, ▪ »what is food reserve tissue for?« and ▪ »what is seed shell for?« <p>explains the importance of seeds to students. Students find the answers with help of bean seeds. They peel and halve the bean seed, find the germ, food reserve tissue and seed shell.</p>	<p>Teacher should always keep in mind sustainable development, independency from corporations and fair trade while leading students through process of learning. Students should realise that they can be active citizens on local and</p>



	10 min	<p>We encourage the conversation among students about topics below.</p> <ul style="list-style-type: none"> ▪ What are conditions for seed germination? Are they given everywhere on our planet? <p>Students list all the places they think are not suitable for germination and plant growth and justify their decision.</p> <ul style="list-style-type: none"> ▪ What is the role of seeds and why are they so important? <ol style="list-style-type: none"> 1. Reproduction of plants. 2. Food for people and animals. ▪ Is this the only way plants reproduce? <p>Vegetative reproduction is a form of asexual plant reproduction e.g. tubers (potato ...), tendrils (strawberries ...), cuttings (blackberries); however it is less often, compared to seed reproduction.</p>	<p>global scale, especially if they as consumers choose organic food. Producers of organic food need organic seed. With purchase of organic food we directly support cultivation of organic and indigenous seeds, which leads to a more sustainable development of planet and better life quality for all of us.</p>
	25 min	<p>Students place on the table seed packages which they brought from home. Teacher brings at least three different seed packages (organic, hybrid and indigenous seed). For explanation of labels see annex 3a.</p> <p>Caution! If one of the students brings treated seeds, the teacher must prohibit opening the package and explains why such seeds are problematic (health hazard).</p> <p>Students explore labels on seed bags: sowing and harvesting time, sowing distance, exploration date, germination, has it been chemically treated, method of seed production (organic, hybrid or indigenous seed). Teacher explains two additional terms: genetically modified seed and plant breeding. We point out that seeds are “alive”. Annexes 3b and 3c are to assist you.</p>	
	5 min	<p>Students select seeds appropriate for school garden, and save them in a dry and dark place until sowing. Packages of home grown seeds are labelled with the following information: plant and variety, year of production and for how many years has this seed been produced at home.</p>	
2	7 min	<p>We look at the videos (in order shown below) with the students:</p> <ul style="list-style-type: none"> ▪ movie trailer »Bitter seeds«: https://www.youtube.com/watch?v=QZtKBKuASc <p>video clip »Monsanto Indian Farmer Suicide«: https://www.youtube.com/watch?v=Av6dx9yNiCA</p>	



8 min	<p>We discuss the content of videos with students. Questions below help us in discussion.</p> <ul style="list-style-type: none"> ▪ Why do such a large number of farmers in India commit suicide? ▪ Why does a multinational company »Monsanto« have such large interest to sell their seed in India? (students' opinion). <p>What kind of seed did »Monsanto« sell to the farmers? (seed without reproductive ability).</p>	Especially focus on the parts about seed trade.
5 min	<p>We visit the webpage of »Monsanto« with students: http://www.monsanto.com/products/pages/monsanto-product-brands.aspx</p> <p>We draw students' attention to what else the biggest seed company sells to farmers besides seed and what does that mean financially for the company. We stimulate students to think about the role of a farmer (from perspective of their dependence). Teacher informs the students that the global seed market was worth 35 billion dollars in 2014 and is projected to reach 74 billion dollars by 2021. You can see the distribution of seed trading profit of multinational companies at the following link: http://blogs.wsj.com/briefly/2014/05/05/5-things-to-know-about-the-state-of-gmos/ (pay special attention to paragraph five).</p>	
5 min	<p>We distribute printed web article »EU Seed Law« https://www.arche-noah.at/files/15-03-18_faq_en-1_iga_-_final.pdf translated in annex 3d.</p> <p>Students thoroughly read the translated article and highlight the essential facts related to seed trade.</p>	
8 min	<p>Students analyze the article in pairs – they discuss the topic and the teacher encourages them to think critically.</p>	
8 min	<p>Teacher writes the students' findings on the board. The class discusses solutions on local and global scale. We emphasize that (for now) in majority of the countries and for majority of the plants, we still have the possibility to choose seeds. We pay special attention to indigenous seeds and our own plant breeding.</p>	
4 min	<p>With the help of their webpage we introduce Austrian organisation »Arche Noah« as an example of good practice: https://www.arche-noah.at/english.</p> <p>We explain succinctly the purpose and activities of organisation.</p>	



4	45 min	Method of evaluation is described below in section "Evaluation tools suggested".	
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Materials and equipment:

- (Lesson 1) Students bring seed packages which they found at home.
- (Lesson 1) 2 soaked bean seeds per student.
- (Lesson 2) Computer with internet access.
- (Lesson 2) Printed article War for seeds.

Teaching tools:

- Annex 3a. Seed bags (pdf).
- Seeds: <https://en.wikipedia.org/wiki/Seed>
- Hybrid: [https://en.wikipedia.org/wiki/Hybrid_\(biology\)](https://en.wikipedia.org/wiki/Hybrid_(biology))
- Seed treatment: https://en.wikipedia.org/wiki/Seed_treatment
- GMO: https://en.wikipedia.org/wiki/Genetically_modified_organism
- Annex 3c. Indigenous varieties (pdf).
- Movie trailer »Bitter seeds«:»https://www.youtube.com/watch?v=QZtKB_KuASc
- YouTube clip »Monsanto Indian Farmer Suicide«: <https://www.youtube.com/watch?v=Av6dx9yNiCA>
- Web page of multinational company »Monsanto«: <http://www.monsanto.com/products/pages/monsanto-product-brands.aspx>
- The value of the global seeds market: <http://blogs.wsj.com/briefly/2014/05/05/5-things-to-know-about-the-state-of-gmos/>
<http://www.businesswire.com/news/home/20161123005424/en/Global-Commercial-Seed-Market-Worth-USD-73.6>
- Online record »The world`s top 10 seeds companies: who owns nature?«: <http://www.gmwatch.org/gm-firms/10558-the-worlds-top-ten-seed-companies-who-owns-nature>
- Webpage of organisation »Arche Noah« <https://www.arche-noah.at/english>
- Publication »Organic Agriculture and Food Security«, IFOAM: http://www.ifoam.bio/sites/default/files/organic_agriculture_and_food_security_printcopy.pdf
- Publication »Organic Agriculture, Environment and Food Security«, Food and Agriculture Organization of The United Nations: <http://www.fao.org/docrep/005/y4137e/y4137e00.htm>

Questions to discuss:

- (Lesson 1) What is a seed and why is it important?
- (Lesson 1) Are the conditions for germination of seeds and food production adequate everywhere on our planet?
- (Lesson 1) Can the same seeds be sown anywhere on the planet? Explain!



- (Lesson 1) Does it matter what kind of seeds (hybrid, GM, organic, indigenous) we sow? Explain!
- (Lesson 2) Why corporations produce seeds that require additional chemical protection and thus contribute to the pollution of environment?
- (Lesson 2) Why farmers purchase seeds which they can't or are not allowed to reproduce by themselves (hybrids, GM)?
- (Lesson 2) How important is the self-sufficiency of a country with seeds – so called seed independence?
- (Lesson 2) What can we do as individuals on local and global level?

Annexes:

- Annex 3a. Seed packages (pdf).
- Annex 3b. Explanation of terms (PDF).
- Annex 3c. Indigenous varieties (pdf).
- Annex 3d. EU Seed Law ArcheNoah (pdf).

Evaluation tools suggested:

- Pupils draw a mind map of all terms they have learned with links to seed trade and with a description of the consequences. They draw themselves as active citizens and link up with terms that they can affect in order to achieve fairness in sustainable development. For help see <http://www.wikihow.com/Make-a-Concept-Map>. **Posters they made are placed in a visible place in school in order to raise the awareness of other pupils.**
- Students can write and explain which seeds (hybrid, treated, organic, GM, indigenous) they would select for sowing in the home garden or school garden.

