

The Baltic Sea Project within the UNESCO ASPnet network

BSP WebQuiz 2022: questions and answers

14-16 years old students: 8 tasks, 45 minutes



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National Coordination
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Network



The Baltic Sea Project



REPUBLIC OF ESTONIA
MINISTRY OF EDUCATION
AND RESEARCH



Question 1

Effective management of **Waste Electrical and Electronic Equipment (WEEE)** follows strategies such as reuse, repair, recycle, and recovery. Discarded WEEE should be repaired before recycling and recovery of the most valuable component present in WEEE - the metal fraction. In the last decades, bioleaching has been emerging as one of the most promising technologies for recovering metals.

Bioleaching refers to the conversion of insoluble solid metals into their water-soluble forms using microorganisms and/or their products. What kind of organisms are used in bioleaching technology?

- A. Fungi
- B. Viruses
- C. Bacteria
- D. Archaea

Sources:

Scientific literature: <https://www.sciencedirect.com/topics/immunology-and-microbiology/bioleaching>

Bioleaching – let's see how it works: <https://www.youtube.com/watch?v=aSb5PNwrRx0>

Question 2

Food industry plays an immense role in climate change. According to FAOs (Food and Agriculture Organisation of the United Nations) studies, food loss and waste is responsible for about 4.4 GtCO₂ eq forming about 8% of all anthropogenic greenhouse gas emissions.

How much food loss, i.e. **avoidable food waste**, does an average Estonian household generate every year (according to 2020-2021 SEI data)? (The data for other Baltic Sea countries is similar or higher).

- A. 23 kg
- B. 43 kg
- C. **63 kg**
- D. 83 kg

Sources:

Piirsalu, E., Moora, H., Väli, K., Värnik, R., Aro, K. and Lillemets, J. (2022). The generation of food waste and food loss in the Estonian food supply chain. SEI policy brief. Stockholm Environment Institute, Stockholm. <http://doi.org/10.51414/sei2022.018>

Scialabba, Nadia. (2015). Food Wastage Footprint & Climate Change._

Question 3

Microplastics are pieces of plastic less than five millimetres in size. Microplastics are created as a result of the wear and tear of plastic products, either during the use of the product or at the point when the product has been thrown away and it begins to decompose. Microplastics are also added on purpose to such products as cosmetics. In total, about 67 trillion microplastic particles enter the Baltic Sea each year from urban sources. 62% result from stormwater runoff including sewer overflow, 25% from wastewater treatment plants and 13% from untreated wastewater.

What type of microplastic mostly ends up in the Baltic Sea with the stormwater runoff? (there's one correct answer)

- A. Microplastic detached when washing textiles.
- B. Microplastic from cosmetics.
- C. Traffic microplastic (from vehicle tyres, brake dust, road wear)**
- D. Microplastics from decaying paint from buildings
- E. Microplastic from plastic pellets used as raw materials in industry

Sources:

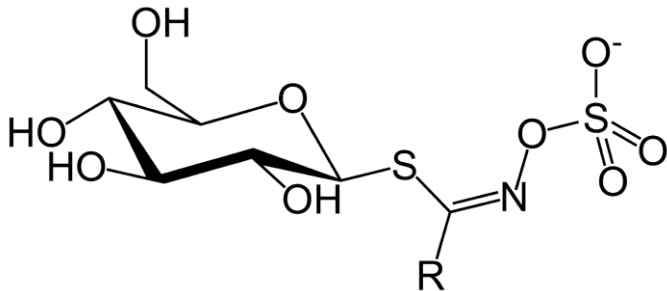
https://www.youtube.com/watch?v=XGQheyVKAsQ&ab_channel=HELCOMChannel

<https://portal.helcom.fi/meetings/PRESSURE%2014-2021-853/MeetingDocuments/3-4%20Draft%20report%20and%20policy%20brief%20on%20traffic%20microplastics.pdf>

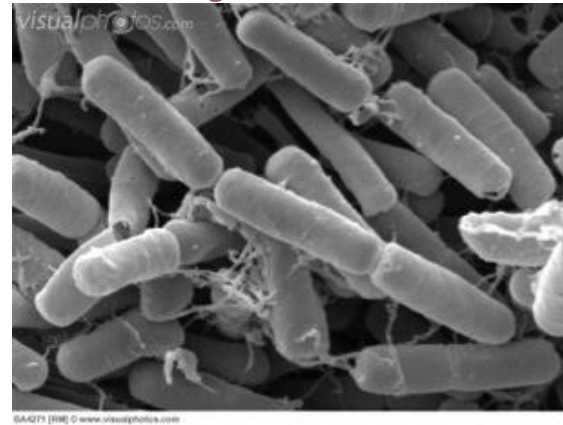
Question 4

Pests are organisms living and growing where they are not wanted. Pests cause damage to plants and crops we use for food: for example red spider mites damage tomato plants by sucking sap from the leaves. In agriculture, pesticides are used to control pests. However active substances included in pesticides can be harmful to bees and other pollinators, and also to humans who eat food or drink water containing large amounts of active substances' residues. The European Commission wants to cut the use of chemical pesticides in half by 2030, as part of its latest plan on sustainability and biodiversity. One of the alternatives, biological pesticides are considered to be less harmful than chemicals and are used in ecological farming. **Look at the pictures below and choose those referring to biopesticides.**

A. Glucosinolate



B. Bacillus thuringiensis

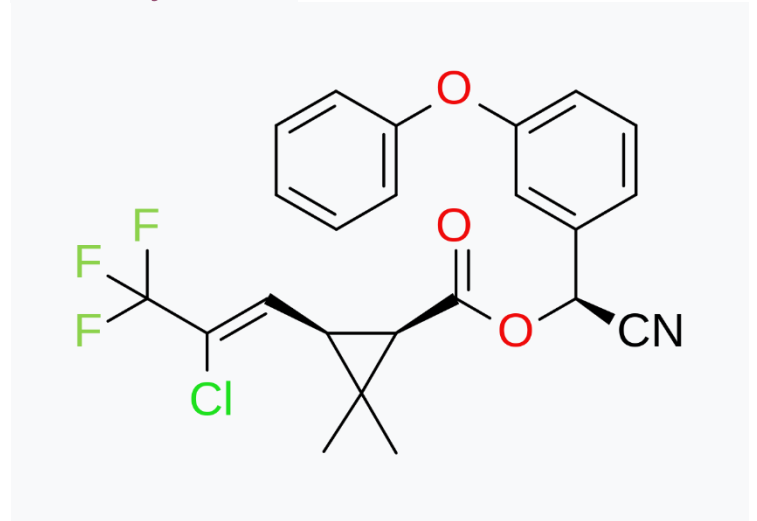


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C. Phytoseiulus persimilis



D. Lambda-cyhalothrin



Correct answers: A. B. C.

D - lambda-cyhalothrin is a synthetic pesticide. Sources: see the links next to the pictures.

Question 5

Every year, globally, at least 12 million girls are married before they reach the age of 18. Yet, child marriage is detrimental to girls' education and health, as they are at higher risk of domestic violence, at greater risk of experiencing complications in pregnancy and childbirth, and at higher risk of contracting HIV/AIDS. Globally, the main risk factor for child marriage is poverty. In recent years, climate change has been seen to increase child marriage rate in some areas. **Which of the reasons stated below would you say is the least plausible explanation to the latter phenomenon?**

- A. Due to climate-change fueled droughts and floods, girls have to spend more time in search of drinking water and burning material needed for cooking. This puts them in jeopardy of falling victim of sexual violence and abductions. In honour-based cultures, this drives families to marry the victim off to save their honour.
- B. Climate change puts further economical burden to families who are already in poverty and in debt, which increases the probability of them marrying off their daughters as child brides, as they rely on dowry as a source of income
- C. Climate change fueled natural disasters negatively impact the life expectancy of adult women, since they are less likely to survive disasters, compared to men. This creates adult sex ratio imbalance in population. In order to bridge the gap, child marriage increases.**
- D. Climate change forces schools to close down, and since families prioritise education of their sons over education of their daughters, girls' education gets to be terminated more likely and they are seen better married off early.

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Sources:

<https://www.girlsnotbrides.org/articles/hidden-connections-climate-change-child-marriage-bangladesh/>

<https://www.girlsnotbrides.org/articles/8-things-read-child-marriage-and-climate-change-world-environment-day-2021/>

<https://fra.europa.eu/en/publication/2017/mapping-minimum-age-requirements/marriage-consent-public-authority-andor-public-figure>

Wrong answer is:

c) - natural disasters do not impact population growth. In fact, the world population is growing. Areas where adult sex ratio is imbalanced, it is due to gender selective contraceptive practices (foeticide, femicide, etc) and one-child policy, not due to climate change.

Question 6:

A couple of years ago, people of a village in the Alps protested against increased particle emissions from a nearby motorway. However the chemical analysis of the particles showed that a considerable amount of the particles came from burning wood in ovens in people's own homes. Globally, household wood burning is one of the most significant sources of fine particle emissions. It is harmful to human health and contributes to climate change. How do scientists distinguish between the particles that came from burning fossil fuels versus burning biomass?

- A. Burning biomass is distinguished by its byproduct soot
- B. Burning fossil fuels is distinguished by its byproduct soot
- B. Fossil fuels contain isotope carbon-14 (radiocarbon), which is not present in wood

D. Wood contains isotope carbon-14 (radiocarbon), which is not present in fossil fuels

Sources: <https://theconversation.com/explainer-what-is-radiocarbon-dating-and-how-does-it-work-9690>
<https://acp.copernicus.org/articles/19/11545/2019/>

Question 7

In the picture you can see over 12 hectares large Dandora dumpsite, located just outside of Nairobi, Kenya. This is the biggest landfill site in East Africa and among the largest in the world. Every single day, 2,000 tonnes of unsorted, unregulated waste is dumped here. A lot of waste comes from North American and European countries, as well as China, which send their used clothes, shoes and accessories as humanitarian help to African countries.



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Read the sentences below and choose the LEAST plausible explanation for fashion items ending up in the landfills of African countries.

- A. Most of the clothes today are made of cheap non-lasting fabrics, and it is not possible to re-sell them in second hand shops.
- B. Clothes that are sent to Eastern-Africa often don't fit the sizes of local consumers.
- C. The clothing factories overproduce clothes so that in case a defect product is found during quality control, it can be quickly replaced. The overproduced clothes are sold on the black market.**
- D. Clothes are mostly made of mixed fabrics that are too costly and hard to recycle. Many European countries don't have appropriate technology to recycle textiles today and so they dump them in low-income countries.

The least plausible explanation is C, because overproduced clothes are new and good quality, they are either dumped at the countries where clothes are produced (like Bangladesh) or sold on the black markets of both high-income and low-income countries. Whereas African countries mostly get used and torn clothes as humanitarian aid.

Other options are correct facts.

Sources:

<https://www.textilemountainfilm.com/>

<https://www.bbc.com/news/av/world-africa-58836618>

Question 8

One of the concepts for species diversity on Earth is shown on the figure on the right. The relationship between species' richness and heterogeneity of the environment has many other examples: for instance, the more diverse vegetation height means more diversity in bird species. Read the statements below and choose the ones that are true and can be explained using this concept.

- A. **Homogenic agricultural landscapes contribute to species' diversity loss globally.**
- B. We can increase biodiversity in cities by only planting trees in the parks.
- C. Periodically clean-cut forest with one dominant tree species can be biologically diverse.
- D. **Towns and cities are typically more biologically diverse than agricultural landscapes.**

Sources: <https://www.jstor.org/stable/3237188>
<https://www.urbangreenbluegrids.com/biodiversity/>

Fig. 10. Relationship between number of vascular plants per $3 \times 100 \text{ m}^2$ plot and the index of environmental heterogeneity. The index ranges from 0 to 1 and summarizes the degree of variation in topography, relative surface ages, substrate texture, pH, and moisture at a site. The index increases with increasing heterogeneity.

