

## UNESCO ASP network Baltic Sea Project's Web Quiz 2019

### Organizer:

Foundation Tartu Environmental Education Centre (Tartu Nature House) in Estonia ([www.tartuloodusmaja.ee](http://www.tartuloodusmaja.ee)), represented by Gedy Matisen and Jelisaveta Dzigurski

### Funder:

Republic of Estonia Ministry of Education and Research (<https://www.hm.ee/en>), represented by Imbi Henno

### Web design and management:

Walk & Learn (<http://www.mineavasta.ee/>), represented by Marko Peterson

This year different Baltic Sea Project's teachers, coordinators and co-operation partners around the Baltic Sea region formed the questions. You can find the references under the questions.

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### SHEET OF QUESTIONS AND CORRECT ANSWERS

Before starting the quiz all participants were asked to check if they have access to:

- 1) Internet connection, 2) video software, and 3) headphones.

Total score is 100 points. This sheet gives you the **correct answers in green**.

NB! Participants should submit their results only once. The organizers will count only the first submitted result for each person.

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### QUESTION 1:

One of the ways to decide is amber real is to look at its inclusions. If there are inclusions of animals that lived at different time than amber formed, it is obvious that this piece of amber is fake. Amber in Baltic Sea is one of the youngest amber in the world - it formed 50 million years ago. **Mark all of the inclusions that can be find in real Baltic amber.**

- a) an ant
- b) a lichen
- c) a snail
- d) a stick insect

Photo from: <https://www.debarsteenspecialist.nl>



Reference: Gretė Vaičaitytė, Lietuvos mokinių neformaliojo švietimo centro  
Photo from: <https://www.debarsteenspecialist.nl/nl/>

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### QUESTION 2:

**Which of these invasive species was the first one that was spread in Baltic Sea?**

a) dwarf crab



b) bay barnacle



c) round goby



d) fishhook waterflea



Photo by Nazar Smirnov: [http://ukrb.in.com/show\\_image.php?imageid=43162&big=1](http://ukrb.in.com/show_image.php?imageid=43162&big=1);

Photo by Andrew Butko:

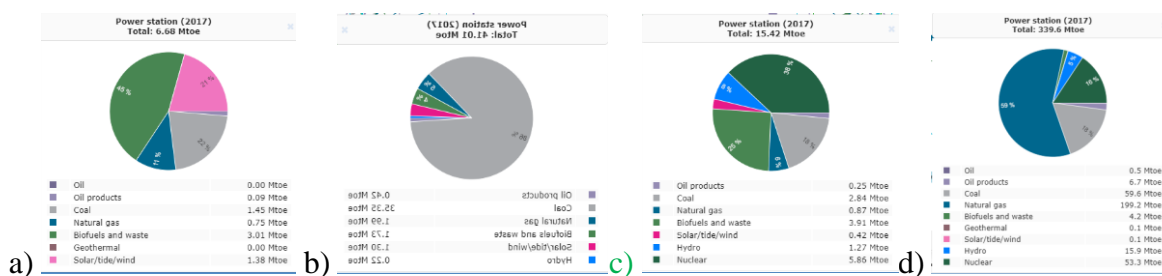
[https://en.wikipedia.org/wiki/Bay\\_barnacle#/media/File:Balanus\\_improvisus\\_on\\_Mya\\_arenaria\\_shell.jpg](https://en.wikipedia.org/wiki/Bay_barnacle#/media/File:Balanus_improvisus_on_Mya_arenaria_shell.jpg);

Photo from: <http://www.invadingspecies.com/round-goby/>;

Photo by Igor Grigorovich: [http://nyis.info/invasive\\_species/fishhook-water-flea/](http://nyis.info/invasive_species/fishhook-water-flea/)

### QUESTION 3:

According to the figures about the balance in production of electricity. Please determine, which figure describes Finland?

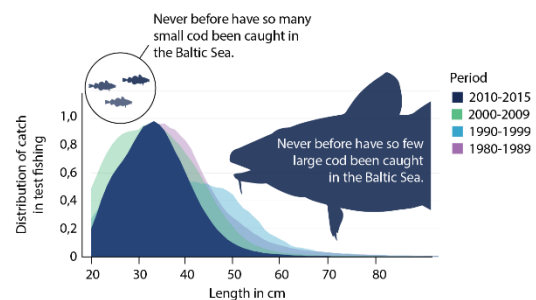


Finland

Reference: Stanislav Babich, Saint Petersburg State University of Economics (<https://www.iea.org/Sankey/>)

### QUESTION 4:

The cod is the Baltic Sea's foremost predator fish and to remain in balance, the ecosystem requires a viable stock with substantial numbers of large cod. Without large predatory fish, stocks of Baltic herring and whitebait will increase. These then bring about a risk of reduction of the zooplankton, which in turn can lead to an increase of phytoplankton. Other large predators, such as pike and walleye cannot replace cod as they are coastal – or too few, like salmon. After decades of overfishing, cod is no longer fulfilling its role as top predatory fish in the ecosystem. Despite some good ideas from time to time, we now see how a failed fisheries policy affects both the environment and the fishing industry. Powerful concrete efforts are required, and they are needed now (<http://balticsea2020.org>). Since July 2019 the European Commission has banned commercial fishing of cod in the majority of the Baltic Sea again to prevent an "impending collapse" of the fish stock. In April, the International Council for the Exploration of the Seas (ICES) found that the eastern Baltic cod population has reached such a low level that it can no longer reproduce sufficiently to maintain a healthy stock. According to ICES, even a total ban on cod fishing in 2020 would not be enough for cod levels to reach even the lowest bottom limit of the stock in 2021 ([www.undercurrentnews.com](http://www.undercurrentnews.com)). **What else should we do to prevent the extinction of cod?**

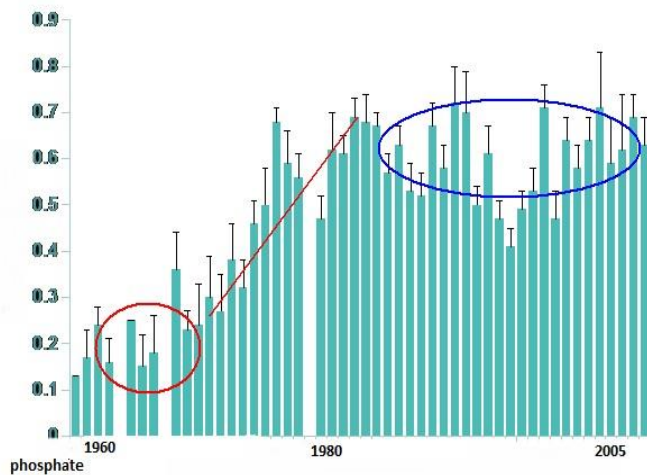


- a) restrict our consumption of codfish
- b) develop better trawling methods
- c) restrict the catching of herring and sprat
- d) restrict the catching of Northern shrimp

Photo from: <https://balticeye.org/en/fisheries/fewer-large-cod/>

### QUESTION 5:

Eutrophication is one of the biggest problems in the Baltic Sea. Eutrophication means an increased supply of water with plant nutrients (nitrogen and phosphorus) through human activities in the catchment areas (mainly through agriculture) and the resulting increased production of algae and higher aquatic plants.



**Which statements about the development of nutrient inputs are true?**

- a) The amount of nitrogen and phosphate which are discharged into the Baltic Sea was 2001 to 2006 lower than in 1995 to 2000.
- b) In 2008 the phosphate and nitrate concentrations are twice as high as in 1960.
- c) Only Kattegat and the northern part of the Gulf of Bothnia and the Gotland Basin are not affected by eutrophication.
- d) By the 2000s, nitrogen inputs and phosphate inputs had increased fivefold compared with the beginning of the last century.

Reference: Sven Hille, Leibniz-Institute for Baltic Sea Research Warnemünde ([www.io-warnemuende.de](http://www.io-warnemuende.de))

### **QUESTION 6:**

There are three causes of the lack of oxygen in the deep layers of the Baltic Sea. Two of them are based on natural conditions. **Which cause is unnatural?**

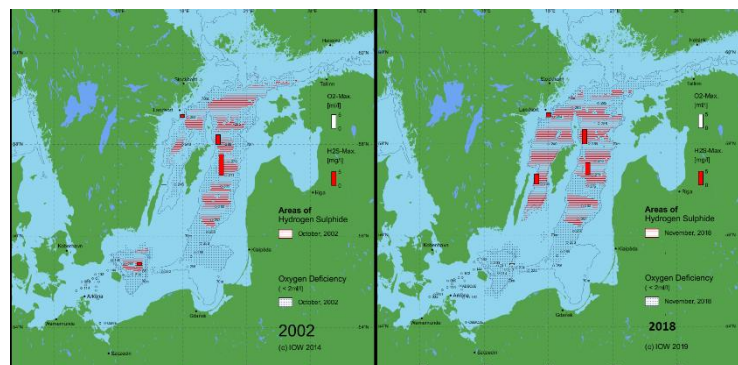
- Until 60m the water is oxygen-saturated and below that point the water has less oxygen and is much more salty. The boundary between these two is impenetrable for oxygen, but not for dead organic matter. The organic matter sinks to the ground.
- At the bottom oxygen is permanently depleted by the decomposition of sunken organic particles. Much organic matter leads to complete consumption of oxygen and the formation of hydrogen sulphide. Algae growth makes the problem bigger, and algae growth is increased by the input of plant nutrients by humans.
- There is irregular inflow from North Sea water in to the Baltic Sea and difficult inflow in very specific meteorological and topographical reasons. Since the water from the North Sea is more salty than the water from the Baltic Sea it piles up at the bottom. These saltier water inflows are the only way deep regions in the Baltic Sea are supplied with oxygen.

Reference: Sven Hille, Leibniz-Institute for Baltic Sea Research Warnemünde ([www.io-warnemuende.de](http://www.io-warnemuende.de))

### **QUESTION 7:**

**What is the cause of the expansion of oxygen depleted areas?**

- There are more organisms in the Baltic Sea. When they die, they sink and get degraded by bacteria, increasing the lack of oxygen.
- The lack of oxygen is caused by the irregular input of saltwater from the North Sea into the Baltic Sea.
- The effect of eutrophication is getting worse and worse due to human nutrient inputs, and in already oxygen depleted areas the oxygen is completely consumed.



Reference: Sven Hille, Leibniz-Institute for Baltic Sea Research Warnemünde ([www.io-warnemuende.de](http://www.io-warnemuende.de))

### **QUESTION 8:**

Oxygen deficiency is not only a situation in the deep areas of the Baltic Sea, but also on the coasts.



## How does the lack of oxygen develop in coastal areas?

- Although algae produce oxygen in the daytime via photosynthesis, they continually respire (consuming oxygen) and have a very short life-span; when algae die, they sink to the bottom.
- During winter season there is less oxygen since the temperature of the water is lower.
- During strong runoff events, oxygen depletion processes are accelerated by rivers increasingly introducing organic matter and nutrients into coastal waters.
- There is no oxygen deficiency in coastal areas at all.

Reference: Sven Hille, Leibniz-Institute for Baltic Sea Research Warnemünde ([www.io-warnemuende.de](http://www.io-warnemuende.de))

### QUESTION 9:

Endocrine disrupting chemicals (EDCs) can cause a number of adverse effects in marine animals. And according to a new scientific report, the risks are likely to be underestimated. The problem is that there are still large knowledge-gaps. A major difficulty in studying EDCs is that their hormone-affecting effects often appear first long after exposure. Even if the animal is exposed to EDCs already in the ovary or fetal stage, the effect can first be detected much later when the animal itself is given offspring. Also, the chemical test requirements we have are generally low, and the tests required for different chemicals do not capture hormone-destructive effects. This means that in the end we do not have the knowledge we need to determine the possible harmful effects of different chemicals. **What are the known impacts of chemicals in water to marine animals?**



- reduced fertility
- reduced immune system
- loss of eyesight and hearing
- increased cases of cancer

Reference: <https://balticeye.org/en/pollutants/harmful-effects-edcs/>

### QUESTION 10:

Emissions of chemicals to the environment can occur throughout the entire life cycle of a chemical substance, from the production to the waste phase. Emissions from e.g. industrial point sources are often important, but in certain cases, the dominant source is diffuse emissions of chemicals present in products used in society. Various products consumed in society contain a wide range of chemicals with different properties. These chemicals may be emitted from the materials via molecular diffusion or abrasion, and eventually disperse in the environment. In

this way, a chemical used for example as a flame retardant in a laptop can find its way to a marine environment such as the Baltic Sea. The continuous development of new products, changing consumption behaviors, and industry's adaptation to updated chemical regulations constantly changes the load and composition of chemical mixtures transferred from land to the marine environment. **What are the reasons why we need better information on our consumption patterns and content of chemicals in products?**

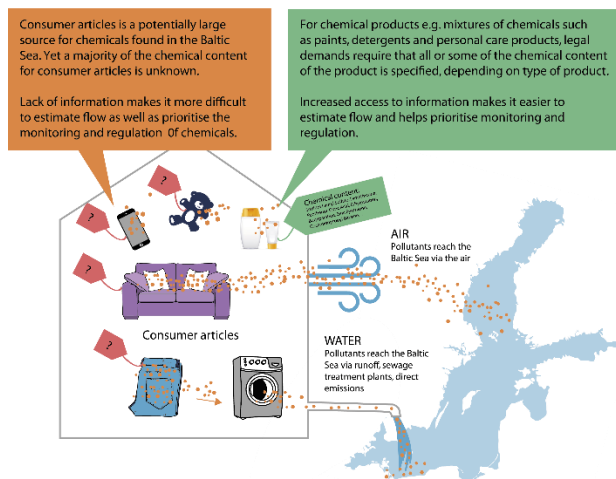
a) To promote a non-toxic environment and a circular economy: Providing information on chemical content to waste handling companies would make it possible to exclude materials that contain hazardous substances from the recycling system.

b) To make sure the people in the companies that pollute would never work again: all companies are lying and hiding behind business secret laws to make more money with polluting the environment.

c) To enable informed decision-making: companies and consumers that want to avoid potentially hazardous chemicals have no possibility of doing so at this moment.

d) To develop chemical monitoring in the marine environment: The list of substances to monitor needs constant updates to include all substances that contribute significantly to any negative impact arising from the current chemical contamination of the marine ecosystem.

More information will help define the chemical status of the Baltic Sea



Reference: <https://balticeye.org/en/pollutants/policy-brief-list-ingredients-on-consumer-articles/>

**The Baltic Sea Project of UNESCO ASP schools** is an international network among schools for a better environment in the Baltic catchment area. The countries bordering on the Baltic share many environmental problems, starting with the pollution of the Baltic Sea. In attempting to solve the environmental problems, education is one of the key factors. The Baltic Sea Project (BSP) has therefore initiated cooperation among schools in all the countries around the Baltic.

Today, over 150 schools are active in the BSP. Most are secondary schools situated on the Baltic coast, but the number of inland schools from the entire catchment area is increasing. In many schools, the BSP is organized as a joint effort including many subjects and teachers working together.

## Objectives

- To increase the awareness of the students about the environmental problems in the Baltic Sea area and to give them an understanding of the scientific, social and cultural aspects of the interdependence between man and nature.
- To develop the ability of the students to study changes in the environment.
- To encourage students to participate in developing a sustainable future.

## Practical measures

- To set up a network of schools and other educational institutions.
- To create and develop educational approaches and joint programs for environmental and international education.
- To organize joint activities and events.
- To publish the BSP newsletter and other relevant information.

## Educational approach

- To achieve a balance between a holistic view and individual subject studies.
- To change the role of the student from passive recipient to active constructor.
- To change the role of the teacher from supervisor to guide in a learning process.
- To use networks to provide participants with opportunities to learn and pass along new ideas.
- To use international cooperation as an inherent element of school work.

**Your school is welcome to join! Contact your county's national coordinator.**

**The Baltic Sea Project's homepage:**

<http://www.b-s-p.org/home/>

**Our blog:**

<https://unesco-bsp.blogspot.com/>

**Our Facebook page:**

<https://www.facebook.com/unesco.bsp/>