

The Baltic Sea Project within the UNESCO ASP network

Baltic Sea WebQuiz 2021: questions and answers

17-19 years old students: 10 questions, 60 minutes



REPUBLIC OF ESTONIA
MINISTRY OF EDUCATION
AND RESEARCH



National Coordination
Estonia



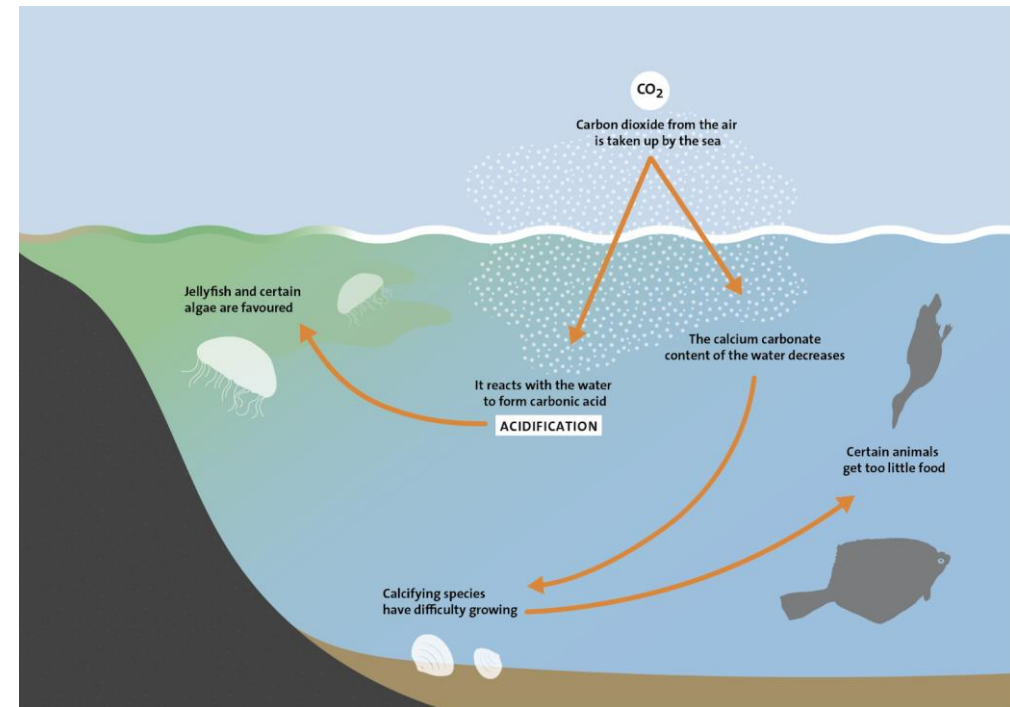
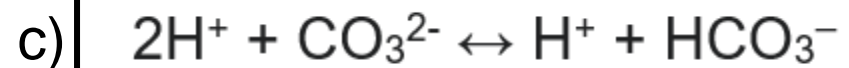
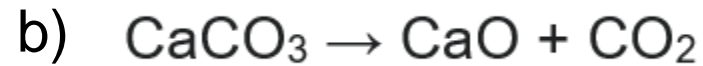
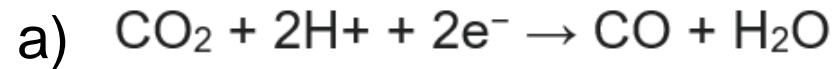
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The Baltic Sea Project

1. The picture below shows the implications of oceans taking up large amounts of atmospheric carbon dioxide. While it is relatively easy to predict the pH reduction in relation to atmospheric increases in carbon dioxide in the open oceans' surface waters, in the Baltic Sea, pH is more affected by other factors (such as salinity, bedrock type, eutrophication and others). However, if atmospheric carbon dioxide continues to increase, it is likely that acidification of the Baltic Sea can not be counteracted by other processes.

Choose a chemical formula that helps to explain why increased acidity negatively affects the formation of carbonate skeletons and shells of marine species.



Picture: <https://balticeye.org/en/policy-briefs/emerging-ocean-acidification-threatens-baltic-sea-ecosystems/>

Resources: https://www.st.nmfs.noaa.gov/Assets/Nemo/documents/lessons/Lesson_3/Lesson_3-Teacher's_Guide.pdf

2. For the many seas in the world contemporary climate change means a rise in the ocean temperatures. Although this is also true in the Baltic Sea, which will be the other two very important climate-induced environmental changes in the Baltic Sea region that are expected to have huge consequences on the biota?

a) reduction of salinity and the disappearance of many marine species in different basins of the Baltic Sea

b) increasing effects of storminess to the Baltic Sea ecosystems due to the reduction of ice cover

c) increase in salinity and loss of many freshwater species in different basins of the Baltic Sea

Resource:

<https://helcom.fi/media/publications/Baltic-Sea-Climate-Change-Fact-Sheet-2021.pdf>

3. The invasive mud crab, *Rhithropanopeus harrisi* preys extensively on macroalgae and invertebrates in the seafloor habitat. What are the consequences of this for the Baltic Sea?

a) decrease in the number of other non-indigenous species in the Baltic Sea

b) disappearance of the natural filtering capacity of the coastal sea

c) heavy blooms of microalgae in seawater

d) increasing biodiversity in coastal areas



Photo: Robert Aguilar, CC BY 2.0, [link](#)

Resource: <https://www.natureasia.com/en/research/highlight/12462>

4. In this video of the research vessel Aranda's voyage from the southern Baltic Sea you can see how a CTD-probe is lowered into the salt water brought by a salt pulse. 1:05 shows how the probe encounters salt water that vibrates like hot asphalt.

[The major Baltic inflow / Itämeren suolapulssi, research vessel Aranda´s cruise winter 2015](#)

As a result of the climate change, sea currents have changed their course and fewer and fewer salt pulses with saline and oxidized water come from the North Sea to the Baltic Sea through the Danish straits. Why are these salt pulses so important for the recovery of the Baltic Sea?

- a) **They reduce the loss of oxygen in the depths of the sea and at the same time prevent eutrophication.**
- b) They increase oxygen loss at sea depths while preventing eutrophication.
- c) They reduce the loss of oxygen in the depths of the sea and at the same time support eutrophication.

Resource:

<https://www.bsag.fi/en/baltic-sea/climate-change/>

<https://helcom.fi/media/publications/Baltic-Sea-Climate-Change-Fact-Sheet-2021.pdf>

5. Bird ringing is the action of marking individual birds with unique coded rings. Bird ringing has been the main method of studying bird migration for over a hundred years. Ringing doesn't only provide information on migration speed and direction, but also on other topics. Which other data can be collected by ringing birds? Choose the most correct answer.

- a) Food preferences, breeding success, height of flight on migration
- b) Body condition, survival rates, breeding success**
- c) Height of flight on migration, health, mate preferences

Resource: <https://www.researchgate.net/publication/228501270> The value of ringing for bird conservation

6. Many studies indicate that fast fashion has one of the largest ecological footprints and is contributing to climate change. Clothes are made of natural or/and synthetic fabric. Production of non-recycled synthetic fabrics requires petroleum and energy, while production of natural fabrics uses land, water and energy. Thus, fabrics have different environmental impacts, though natural fabrics in general are more environmentally friendly if produced and consumed wisely. Read the following statements and chose one that describes raw material for the linen fabric.

- a) Production of this plant contributed to drying up a lake which was once the fourth largest lake in the world. (*non-organic cotton*)
- b) In most areas cultivating this plant on the same field is limited to once every six years. (*linen, one of the most eco-friendly materials*)**
- c) This raw material sometimes comes from ancient and endangered forests. (*viscose*)

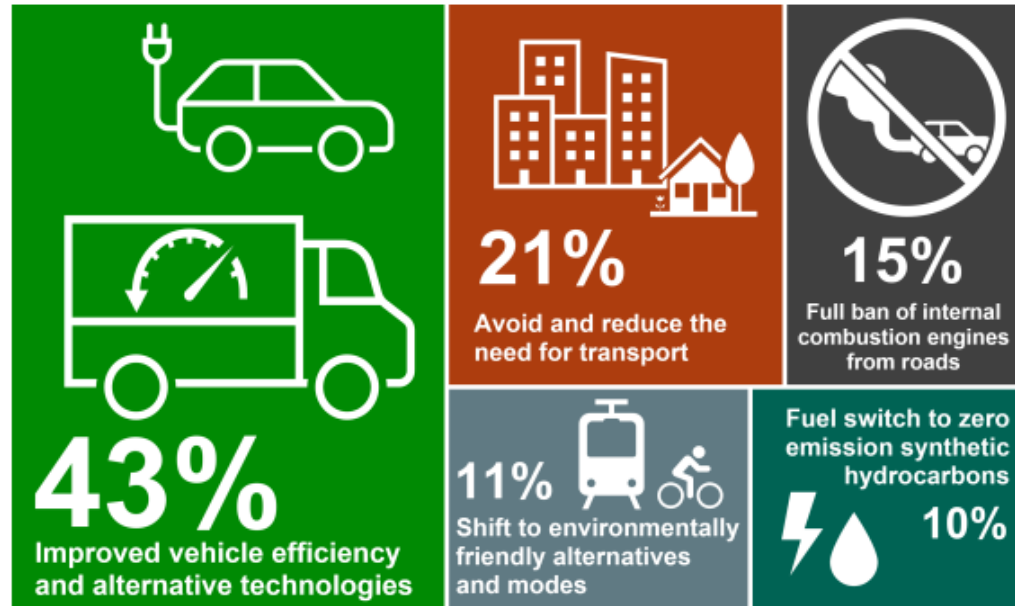
Resources:

<https://www.britannica.com/plant/flax>

<https://cfda.com/resources/materials/detail/rayon-viscose>

<https://earthobservatory.nasa.gov/world-of-change/AralSea>

7. The way people and goods move within our cities, between countries and continents has a huge impact on climate change. In the EU, the transportation sector contributes 27% of the overall greenhouse gas (GHG) emissions. It is one of the sectors which has increased emission greatly since 1990. Look into the ways of transforming the transport sector to lower emissions significantly:



Share of total emission reduction in 2040 (%).

Think about your habits and needs - is it possible for you to get to school today on foot, by bicycle or by public transportation or do you need to be dropped by car?

Indicate a country that has invested 100 million euros to create high-speed bicycle routes and parking facilities to encourage even more bicycle travel and less car use:

- a) Estonia
- b) The Netherlands**
- c) Finland
- d) Sweden

Graph: <https://newclimate.org/2020/09/04/a-radical-transformation-of-mobility-in-europe/>

Resource: <https://newclimate.org/2020/09/23/the-eu-can-foster-the-transformation-in-the-transport-sector/>

8. One of the major questions in achieving climate goals is how to make our energy cleaner. Recently a debate unfolded about the impacts of Europe's increasing biomass energy use and what it means for the forests in Estonia.

Read the following article: <https://www.theguardian.com/world/2021/jan/14/carbon-neutrality-is-a-fairy-tale-how-the-race-for-renewables-is-burning-europes-forests>

and select answer(s) which are CORRECT:

- a) Burning wood releases less carbon dioxide per unit of energy than burning gas, oil, or coal.
- b) Biomass, of which wood from forest is the main source, makes up nearly 60% of the EU's renewable energy supply**
- c) It is not allowed to clean-cut forests in Estonia
- d) Woodland birds are declining at a rate of 5000 breeding pairs a year

9. Marine archeology studies human interactions with the sea, lakes and rivers. The remains of human activity (e.g. shipwrecks) below the surface are called underwater cultural heritage. They are part of our common memory and help study not only cultural, but also environmental history, including previous changes in the world's climate. To protect this submerged heritage, UNESCO Member States adopted the UNESCO Convention on the Protection of the Underwater Cultural Heritage in 2001. Choose the statement below that is INCORRECT:

- a) **The Baltic Sea bottom sediments have good conditions for shipworms (*Teredo navalis*) who in turn help to preserve shipwrecks.**
- b) The Baltic Sea bottom anaerobic environment protects physical objects from degradation
- c) It is possible to find prehistoric dwellings below the waves of the Baltic Sea
- d) The national borders of the countries around the Baltic Sea do not prevent investigating sea heritage

Resource: <https://www.marinefinland.fi/en-US>

10. Today, record-breaking numbers of refugees and migrants are moving across international borders, fleeing conflict, persecution, poverty and other life-threatening situations, including environmental disasters and impacts of climate change. Often these diverse factors interact and there is not a one single reason why people are forced to leave their home.

Which of the following refugee crises is(are) considered to also be strongly connected to climate change?

- a) Belarus-EU border crisis
- b) Turkey's migrant crisis**
- c) Central American mass migration to the United States**

Resources <https://environmentalmigration.iom.int/blogs/central-america-disasters-and-climate-change-are-defining-migration-trends>

<https://www.climateforesight.eu/migrations-inequalities/environmental-migrants-up-to-1-billion-by-2050/v>

Baltic Sea WebQuiz 2021

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