

Lesson 4



NATURAL PHENOMENA II: EARTHQUAKES, VOLCANOES, TSUNAMIS AND FLOOD.

Lesson objective: to learn about various nature phenomena such as earthquakes, tsunamis, volcanoes and floods and how are they affecting climate change.

Terms: earthquake, volcano, floods, magma, lava, seismograph

Materials required for the Eco workshops: Cardboard box, Paper or plastic cup, String, Marker, Scissors, Paper, Taps, Coins or other weights.



Learning objective:

Encourage students to think about the interior of the Earth.

ACTIVITIES

Teacher: turns on the screen and leads the discussion.. **Pupils:** answer the questions.

On the screen: questions.

- What do you know about the Earth's surface?
- Was Earth's surface always solid?
- Do you know what does the Earth interior look like?

2. Interactive task

3 min. 🕚

5 min. 🕚

Learning objective:

Encourage students to think about the materials found in the interior of the Earth.

ACTIVITIES

Teacher: coordinates activity. **Pupils:** pick one image.

On the screen: pictures with text.

1. Earth with diamonds

• There are planets where diamonds fall instead of raindrops. There may be planets whose centers are made of diamonds, but they do not form the center of the Earth.

2. Earth with gas

• There are planets, like Jupiter and Saturn, that don't have hard surfaces and instead have swirling gases above a solid core. There may be planets whose centers are made of diamonds, but they do not form the center of the Earth.

3. Earth with magma

• Bravo! You made the right choice. The interior of the Earth is made of magma.

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Learning objective:

To teach students about the interior of the earth.

2 min. 🕚

2 min. 🕚

ACTIVITIES

Teacher: coordinates activity. **Pupils:** listen to the information.

On the screen: animation about planet Earth.

At the beginning our planet had a liquid, hot surface. Trough the time the surface had cooled down and formed a crust.

However, the Earth still hasn't cooled down completely. Under the crust there is a big layer of rocks and minerals but beneath them the Earth is still hot and liquid.

4. Information (Audio/video)

Learning objective:

To teach students about the existence of tectonic plates.

ACTIVITIES

Teacher: coordinates activity. **Pupils:** listen to the information.

On the screen: tectonic plates with text.

The solid part of the Earth is actually broken into different pieces which can move on molten magma. There are 7 large continental and oceanic tectonic plates, 6-7 middle tectonic plates and several smaller ones.

Notes:

5. Interactive task

Learning objective:

To engage students in learning about the arrangement of tectonic plates.

ACTIVITIES

Teacher: coordinates activity. **Pupils:** drag and drop.

On the screen: interactive puzzle.

Tectonic plates arranged in appropriate places on Earth are shown. After that the plates are pulled to the bottom bottom (automatically) but the yellow lines remain. Students must pull the tectonic plates to the appropriate places. When the plate is arranged in correct place, the name of the plate is hear.

6. Interactive task

Learning objective:

To learn about creation of geological formations and where are they located

ACTIVITIES

Teacher: coordinates activity. **Pupils:** drag and drop.

On the screen: map with various geological formations.

Since they can move, they interact along their borders where they can merge, move away or glide side by side. The interaction of tectonic plates has create various geological formations..

Notes:



7. Discussion

3 min. 🕚

Learning objective:

To encourage students to think about why the earth shakes.

ACTIVITIES

Teacher: leads the discussion. **Pupils:** express opinions.

On the screen: questions.

- Have you ever felt, or heard of the Earth trembling?
- What do we call such an event?
- What do you think is the cause of the earthquake?

8. Discussion with an interactive task

5 min. 🕚

Learning objective:

To encourage students to think about where on Earth, earthquakes can be felt.

ACTIVITIES

Teacher: leads the discussion. **Pupils:** express opinions.

On the screen: map and questions.

- In which of the three marked states on the map do you think earthquakes can be felt?
- Do you have any idea why earthquakes can be felt in Croatia, while they are not felt in Latvia and Lithuania?

Notes:

Learning objective:

To learn about earthquakes.

ACTIVITIES

3 min. 🕚

Teacher: coordinates activity. **Pupils:** listen to the information.

On the screen: Animation of the earthquake and the passage of the earthquake through the layers of the Earth.

When tectonic plates rub against each other, huge amounts of energy is released in the form of earthquakes. The earthquake is sudden shaking of the earth that usually arises where two plates meet. Earthquakes can occur as result interaction between two plates that are ether sliding pass each other or beneath each other and then they get stuck. Then when they suddenly slip a large amount of energy is released in a form of so called seismic waves.

10. Interact	ive task	5 min. 🕚
Learning objective:	To learn about Richter scale.	
	ACTIVITIES	
Pupils: click on va different sizes.	arios points so they can see different o	utcomes of earthquakes of
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Learning To learn about detecting and measuring the strength of earthquakes.

ACTIVITIES

5 min. 🕚

5 min. 🤇

Teacher: coordinates activity. **Pupils:** listen to the information.

On the screen: questions.

- How can we know how to measure the strength of the mentioned earthquakes?
- Is there an earthquake measuring device?

A seismograph is a device used to record seismic waves produced by an earthquake or explosion. New and modern seismographs can detect earthquakes and measure the time at which the earthquake occurred, starting point of the earthquake, the depth at which earthquake occurred and the amount of energy released by the earthquake.

12. Information (Audio/video)

Students learn what to do when an earthquake occurs.

ACTIVITIES

Teacher: coordinates activity. **Pupils:** listen to the information.

On the screen: question.

Learning

objective:

• What to do during an earthquake?

If you are inside, stay inside. Drop down onto your hands and knees, cover your head and neck underneath a sturdy table or desk and hold on to your shelter until the shaking stops.

If you are outside, stay outside and move away from trees, telephone poles, and buildings!

13. Eko workshop

Learning objective:

Students are taught how to make a seismograph.

ACTIVITIES

Teacher: coordinates activity and gives instructions. **Pupils:** build their own seismograph.

On the screen: instruction on building seismograph.

Materials required for the activity: Cardboard box, Paper or plastic cup, String, Marker, Scissors, Paper, Taps, Coins or other weights.

14. Information (Audio/video)

Learning objective:

To learn how earthquakes affect climate change.

ACTIVITIES

Teacher: coordinates activity. **Pupils:** listen to the information.

On the screen: question.

• How are eartquakes related to climate change?

By warming the earth's surface, polar caps are melting and the sea level is rising which affects the pressure on the tectonic plates. Pressure sometimes changes very suddenly and large amounts of energy are released in the form of earthquakes that can cause tsunamis.

Hurricanes and typhoons can occasionally trigger "slow earthquakes," which release energy over longer periods of time making them weak so we can not feel them.

Notes:

3 min. 🕚

Learning objective:

Learning

objective:

To learn about tsunamis.

ACTIVITIES

Teacher: leads the discussion. **Pupils:** express opinions.

On the screen: qustions.

- How tall are the biggest waves you've seen?
- Do you know how tall waves can be?
- Have you ever heard about Tsunamis?

16. Interactive task

To learn what can cause a tsunami.

ACTIVITIES

Teacher: coordinates activity. **Pupils:** participate in performing tasks, present ideas and find correct answers.

On the screen: images of tsunami causes are shown.

A tsunami is caused by large, undersea earthquakes, underwater landslides, meteorites or volcanic eruptions. Ships can not see the tsunami because in deep ocean, they appear like waves only a half meter tall, but as they approach the shoreline and enter shallower water they slow down and become stronger and higher.

The retreating of sea water is an important warning sign of a tsunami. The best defence against any tsunami is early warning that allows people to seek higher ground.

17. Interactive task

Learning objective:

To Repeat and connect main ideas.

ACTIVITIES

Teacher: coordinates activity. **Pupils:** match the images.

On the screen: images pupils have to match.

5 min





18. Discussion

Learning objective:

Encourage students to reflect and express their ideas about floods.

3 min. 🕚

5 min. 🕚

ACTIVITIES

Teacher: coordinates activity. **Pupils:** express opinions.

On the screen: questions.

- Sometimes the water in the rivers can also rise and spread out of the riverbed. How do we call that phenomena?
- What causes floods?

19. Interactive task

Learning objective:

To learn why floods happen and what can cause them.

ACTIVITIES

Teacher: coordinates activity. **Pupils:** choose the correct images.

On the screen: text with images.

Floods are the most frequent type of natural disaster and occur when an overflow of water submerges land that is usually dry.

Floods are often caused by heavy rainfall or rapid snowmelt. Because of this the floods are more often as the temperature rises and the climate changes.

Notes:

20. Interactive task

Learning objective:

To learn that movement of tectonic plates can create volcanoes.

2 min. 🕚

3 min. 🕚

ACTIVITIES

Teacher: coordinates activity. **Pupils:** choose the correct images.

On the screen: question with four images.

Which of the following phenomena can occur due to the movement of tectonic plates?

- Volcano;
- Rainbow;
- Blizzard;
- Meteor shower.

21. Information (Audio/video)

Learning objective:

Notes:

To learn about volcanoes and how they are connected to climate change.

ACTIVITIES

Teacher: coordinates activity. **Pupils:** listen to the information.

On the screen: animation of a volcano.

A volcano is an opening in Earth's crust. When a volcano erupts, hot gases and melted rock from magma chamber deep within Earth find their way up to the surface. Magma released from a volcano is known as lava. Volcanic eruptions can be very destructive. But they also create new landforms. During major explosive eruptions huge amounts of volcanic gas, and ash are injected into the atmosphere.

However, although volcanic eruptions can lead to warming of the climate they are more often mentioned with period of cooling. There were such volcanic eruption that threw enormous amounts of ash and other particles in the air. These particles shielded earth's crust from the sun, which lead to a short - lived global cooling period.

22. Interactive task

Learning objective:

To repeat the most important information learned during this lesson.

ACTIVITIES

Teacher: coordinates activity. **Pupils:** match images with a corresponding term.

On the screen: 4 images and 4 terms.

- Earthquake;
- Volcano;
- Tsunami;
- Flood.

23. Interactive task

Learning objective:

To repeat the most important information learned during this lesson.

ACTIVITIES

Teacher: coordinates activity. **Pupils:** match images with a corresponding term.

On the screen: 4 images and 4 terms.

- Earthquake;
- Volcano;
- Tsunami;
- Flood.

Notes:

1 min. 🕚

24. Discussion

3 min. 🕚

Learning objective:

To learn new information about next lesson.

ACTIVITIES

Teacher: coordinates activity. **Pupils:** listen to the information.

On the screen: quastions and images.

- Who do you think heats up the atmosphere more?
- Who do you think has more influence on global warming people or volcanoes?

More greenhouse gases are released into the atmosphere by humans, thereby warming the atmosphere more. The burning of fossil fuels, the cuttiong of forests, and animal husbandry increasingly influence the climate and temperature of the Earth. This adds huge quantities of greenhouse gases to the naturally occuyring ones in the atmosphere, increasing the greenhouse effect and global warming.

Notes:

Source references:

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