



What is a seismograph?

STEM4inclusive schools
WP2 – Toolbox

Școala Gimnazială Nr. 7, Galați

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Structure of the activity

A Introduction

about the topic

What is a seismograph?

B Training phase

about the training

Build your own seismograph

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A: About the topic

What is a seismograph?

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Definition!



What is a seismograph?

A seismograph is an instrument used to detect and record seismic waves caused by earthquakes, explosions, or other ground-shaking phenomena. It consists of a ground-motion detection sensor, called a seismometer, and a recording system.

When the ground shakes, the seismometer detects these movements and converts them into electrical signals. These signals are then processed and recorded, creating a visual representation called a seismogram. Seismographs are crucial for studying earthquakes and understanding the Earth's internal structure.



Did you know?

The earliest seismoscope was invented by the Chinese philosopher Zhang Heng in A.D. 132. This was a large urn on the outside of which were eight dragon heads facing the eight principal directions of the compass. Below each dragon head was a toad with its mouth opened toward the dragon.



<https://www.britannica.com/biography/Zhang-Heng#/media/1/105559/210278>

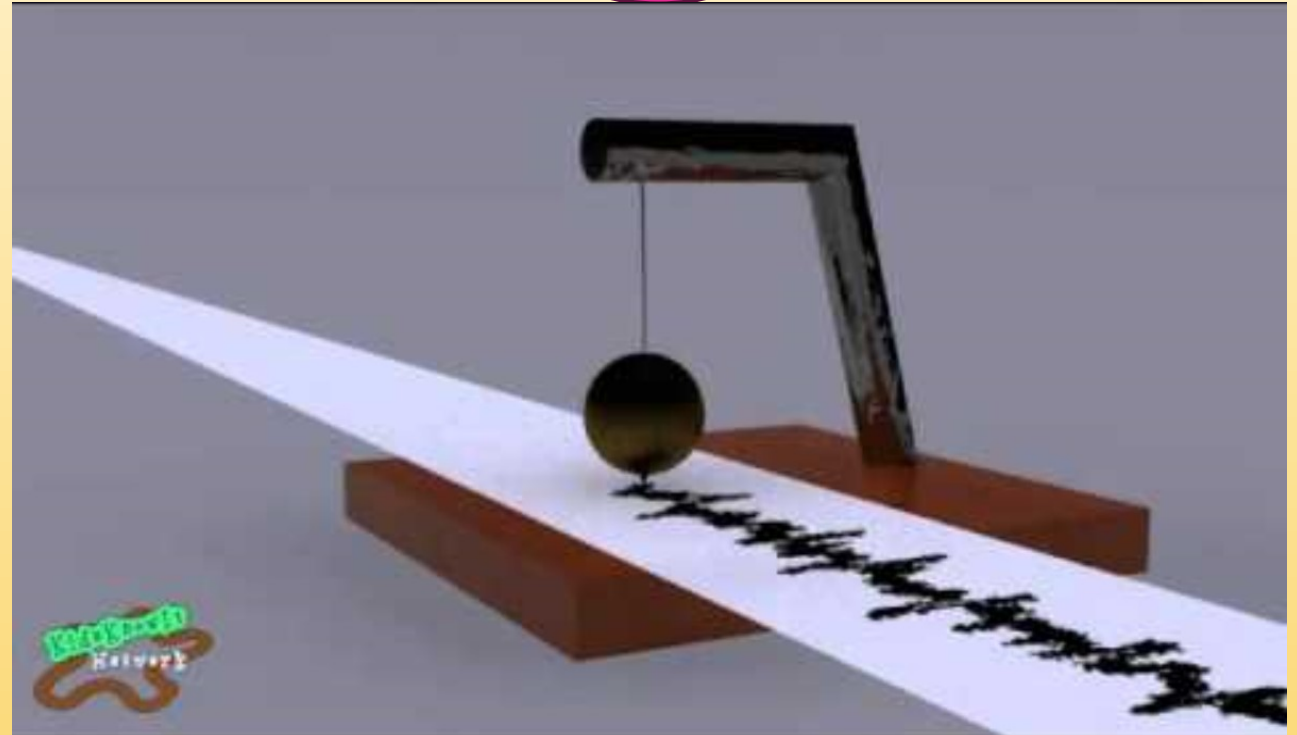
Accessed: 12.11.2024





Let's have a look at this
youtube video!

The seismograph video



Youtube channel name: Hiram Bertoch
Name of video: **How a Seismograph Works**
Link: <https://youtu.be/Gbd1FcuLJLQ?si=fStTwr9xZtX-wxvS>
Accessed: 12.11.2024

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How seismographs work?

Seismographs work by detecting and recording the vibrations caused by seismic waves.

1. Seismometer: At the heart of a seismograph is a seismometer, which includes a mass (or pendulum) suspended on a spring. This mass remains stationary when the ground moves.

2. Ground Movement: When an earthquake or other seismic event occurs, the ground shakes, causing the seismograph's frame to move.

3. Relative Motion: The stationary mass inside the seismometer does not move with the frame. Instead, it stays still due to inertia, while the frame moves around it.





How seismographs work?

4.Detection and Recording: This relative motion between the mass and the frame is detected by sensors, which convert it into electrical signals. These signals are then amplified and recorded, usually on a rotating drum or digital storage, creating a seismogram.

5.Seismogram: The seismogram is a visual record of the seismic waves, showing the amplitude and frequency of the ground motion over time. This data helps scientists analyze the strength, duration, and location of the seismic event.





Did you
know?

While modern seismographs record the Earth motions as an electrical signal, older seismographs would use a pen to draw the signal directly on paper.

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How a seismograph looks



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https://commons.wikimedia.org/wiki/File:Seismograph_recording.jpg

Accessed: 12.11.2024

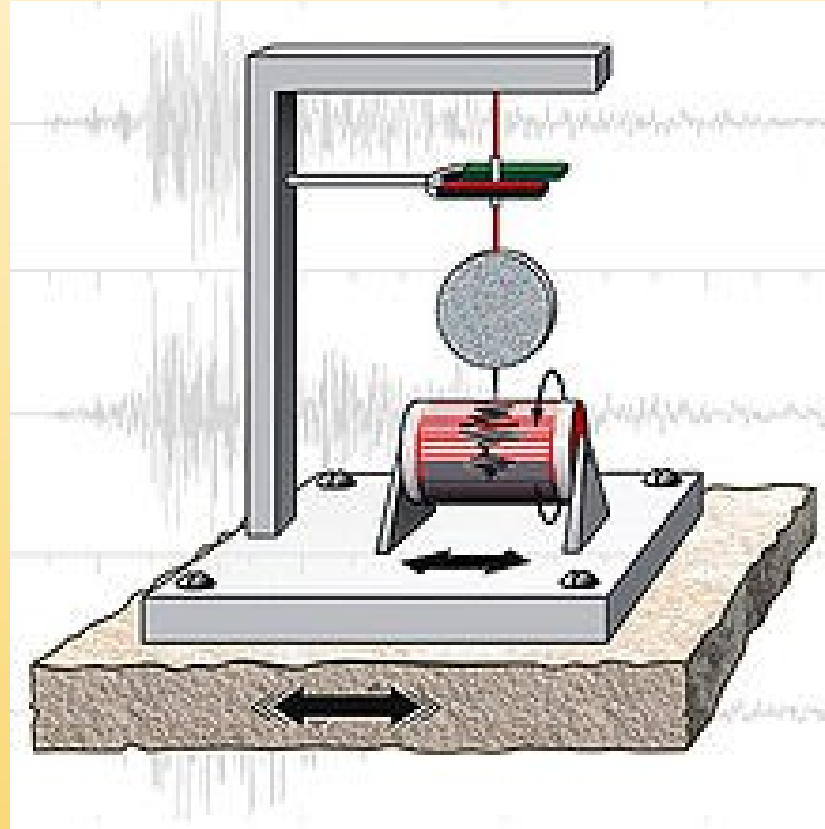


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How a seismograph looks



<https://en.wikipedia.org/wiki/Seismometer#/media/File:Seismographs.jpg>

Accessed: 12.11.2024





What is required for a simple seismograph?

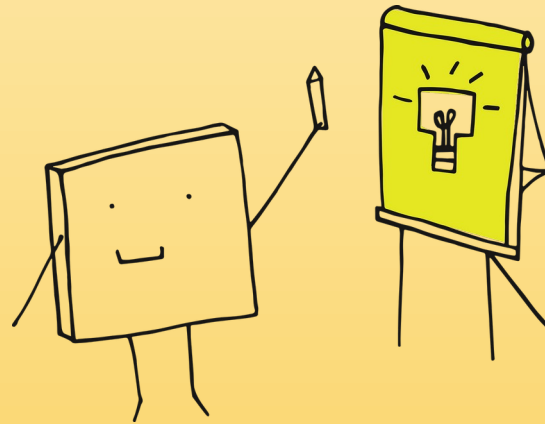
Device Type	Tasks
Frame(cardboard box)	It stays still when the ground is moving
Pendulum suspended on a spring (plastic cup, coins)	It is moving when the ground is moving
Marker	For drawing the seismogram
Sheet of paper	For recording the seismic moves on it





B: Training phase

Build your own seismograph



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Task 1:



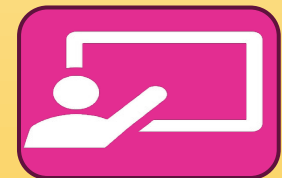
- Draw a plan for your seismograph. Work in **pairs** to complete the task and include also the learners who are not able to draw on their own by integrating their comments and ideas.

- You have **20 minutes** to design and create the seismograph. If there are learners with special needs in your group, you will receive an additional **10 minutes** to ensure that their contributions and ideas are fully integrated, while other pairs work on refining their solutions.



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- Ensure that you collaborate effectively with your partner. Support learners who may have visual or physical impairments, ensuring everyone has the opportunity to contribute.



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Task 2:

- Let's have a look at the following video:

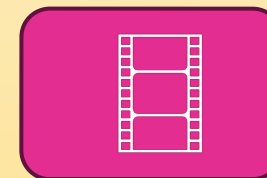


Youtube channel name: Science Buddies

Name of video: **How to Make a Seismograf-STEM Activity**

Link: <https://youtu.be/41RzGwZINOk?si=hxQByz-z8thjhYBR>

Accessed: 12.11.2024



Describe what you saw in a video. Please work together with other person or record an audio about your ideas with your mobile phone.



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Task 3:

- Build your seismograph and test it with your pair. Shake the box back and forth (perpendicular to the paper strip, keeping the bottom of the box in contact with the table) as your colleague continues to pull the paper strip through.
- Can you tell how hard the box was shaking based on the line? Can you tell when the box was not shaking at all?
- Write down your observations.



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H5P- Tasks 1: What is a seismograph?

A seismograph is an instrument used to detect and record seismic waves caused by earthquakes, explosions, or other ground-shaking phenomena.

☐ True

☐ False

☒ Submit

H5P

 Reuse

I am confused 

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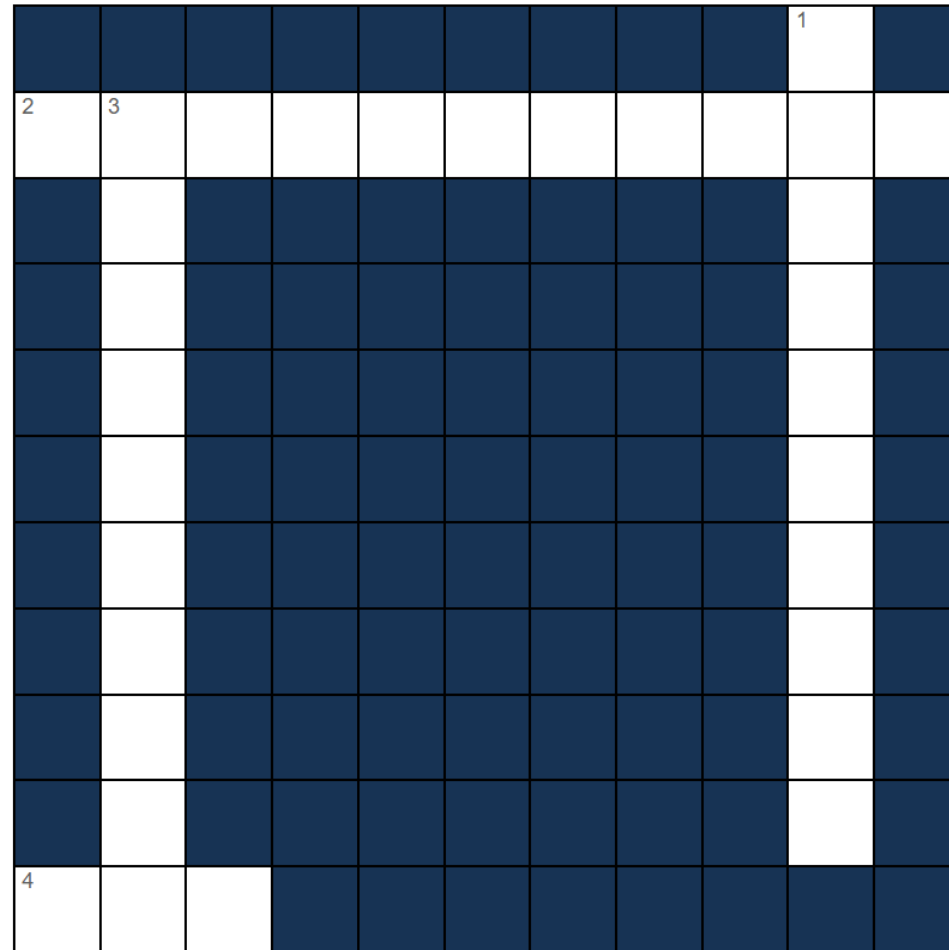
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H5P- Tasks 2: Which are the components of a seismograph?



Across

2 This instrument includes a mass (or pendulum) suspended on a spring. (11)

4 The older seismographs use it to draw the signal directly on paper. (3)

Down

1 The visual record of the seismic waves. (10)

3 What is causing the seismograph's frame to move? (10)





H5P- Tasks 3: About the seismogram

When a seismic event occurs the seismogram is a



broken line

straight line

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Congratulations!

You mastered the activity about what is a seismograph and create one.

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