

Discovering Geosciences: your interest and understanding of natural phenomena

The Earth has a lot to tell — and you? This questionnaire is the first step to explore our planet and understand how much you already know... or how much you can still learn!

* Indicates a required question

What class are you in? *

Mark only one oval.

☐ 4A

☐ 4B

☐ 4C

☐ 4D

1b. How interested are you in scientific research? *

Mark only one oval.

☐ Not at all interested

☐ Slightly interested

☐ Moderately interested

☐ Very interested

2b. Would you like to work in a scientific field in the future? *

Mark only one oval.

☐ Yes, definitely

☐ Maybe, but not sure

☐ No, not interested

- 3b. How interested are you in studying geology, geophysics or other Earth science-related disciplines at university?

Mark only one oval.

- ☐ Not at all interested
- ☐ Slightly interested
- ☐ Moderately interested
- ☐ Very interested

- 4b. Do you know what INGV is and what it does? *

Mark only one oval.

- ☐ Yes, and I can explain some of its activities well
- ☐ Yes, but I have only a vague idea of what it does
- ☐ No, I don't know it

- 5b. How much do practical or laboratory activities help in understanding natural phenomena?*

Mark only one oval.

- ☐ They are essential to better understand the phenomena
- ☐ They are useful, but not indispensable
- ☐ They are interesting but not helpful to better understand the phenomena
- ☐ They are just a fun way to spend time

6b. Did the educational activity that you performed at school increase your interest in Earth Sciences?*

Mark only one oval.

- ☐ Yes, I discovered a new interest
- ☐ It confirmed me an interest that I already had
- ☐ It did not interest me
- ☐ I did not participate at the activity

How well do you understand the following scientific concepts? *

Mark only one oval per line.

		None	A little	Moderately	A lot
7b.	Density	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8b.	Viscosity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9b.	Earthquake epicenter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10b.	Earthquake hypocenter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

11b Which factors influence the type of an eruption? *

Mark only one oval.

- ☐ Explosive eruptions are favored in magmas with high viscosity and low gas content
- ☐ Explosive eruptions are favored in magmas with low viscosity and low gas content
- ☐ Explosive eruptions are favored in magmas with low viscosity and high gas content
- ☐ Explosive eruptions are favored in magmas with high viscosity and high gas content

12b. What is the role of viscosity in explosive eruptions? *

Mark only one oval.

- ☐ High viscosity also implies high magma density
- ☐ High viscosity hinders gas escape, causing pressure buildup inside the magma
- ☐ High viscosity facilitates gas release before eruption, thus reducing deep pressure
- ☐ High viscosity causes a temperature increase in magma

- 13b. What is the relationship between magma viscosity and the rise speed of gas bubbles within it? *

Mark only one oval.

- ☐ In low-viscosity magmas, bubbles rise faster than in high-viscosity ones
- ☐ The rise speed of gas bubbles depends only on their density
- ☐ In low-viscosity magmas, bubbles rise more slowly than in high-viscosity ones
- ☐ Bubbles rise at the same speed regardless of magma viscosity

- 14b. How can the viscosity of a liquid be calculated by observing the rise of bubbles within it? * *Mark only one oval.*

- ☐ By measuring bubble size and comparing it with known parameters describing liquid behavior
- ☐ By measuring bubble diameter, and if the liquid temperature is known, viscosity can be derived
- ☐ By measuring bubble rise speed and size, and balancing the involved forces: gravity, buoyancy, viscous resistance
- ☐ By comparing the liquid's color with a standard table associating colors to physical properties

- 15b. Why is it important to combine laboratory experiments and numerical simulations in studying natural phenomena such as volcanic eruptions? *

Mark only one oval.

- ☐ Because both techniques help avoid direct field observations
- ☐ Because experiments and numerical simulations complement each other in describing and interpreting volcanic events
- ☐ Because numerical simulations are always more reliable than real experiments
- ☐ Because only experiments and simulations can certainly estimate if and when an eruption will occur

- 16b. By how much does the energy released by an earthquake of magnitude $M=5$ increase compared to one of $M=3$? *

Mark only one oval.

- ☐ 2 times
- ☐ 10 times
- ☐ 30 times
- ☐ 900 times

17b. Which of these statements is true? *

Mark only one oval.

- ☐ Moving away from the earthquake hypocenter, the difference in arrival times of seismic waves ($t_S - t_P$) remains unchanged
- ☐ Seismic waves lose energy as they propagate from the earthquake hypocenter
- ☐ To calculate the earthquake epicenter, you must determine the amplitude of S-wave arrivals
- ☐ The Richter magnitude is calculated from the ratio of S-wave amplitude to the duration of the shaking

18b. What are dromocrones? *

Mark only one oval.

- ☐ They are space-time diagrams representing seismic wave arrival times
- ☐ They are instruments used to record the depth of hypocenters
- ☐ They are graphs showing the variation in intensity of seismic shocks over time
- ☐ They are maps showing the geographic distribution of earthquakes

19b. What does a seismometer measure? *

Mark only one oval.

- ☐ It is an instrument that only measures ground vibrations caused by seismic waves
- ☐ It is an instrument that measures all ground vibrations including those caused by wind or passing cars
- ☐ It is an instrument that measures soil temperature and humidity
- ☐ It is an instrument that measures building damage caused by seismic waves

20b. What is the main difference between the Richter and Mercalli scales? *

Mark only one oval.

- ☐ The Richter scale measures the damage intensity, while the Mercalli scale measures the released energy
- ☐ The Richter scale measures released energy, while the Mercalli scale measures observed damage intensity
- ☐ Both scales measure the energy released, but use different units
- ☐ The Mercalli scale measures magnitude, while the Richter scale measures perceived intensity