Supplementary Material A

Biology and Geology 10th grade

Name: _____ Nº: _____

1. Define volcanism and explain its importance for the study of Earth's history.

_____
_____
_____
_____

2. Distinguish between active and inactive volcanism. Give two examples of each.

_____
_____
_____
_____
_____

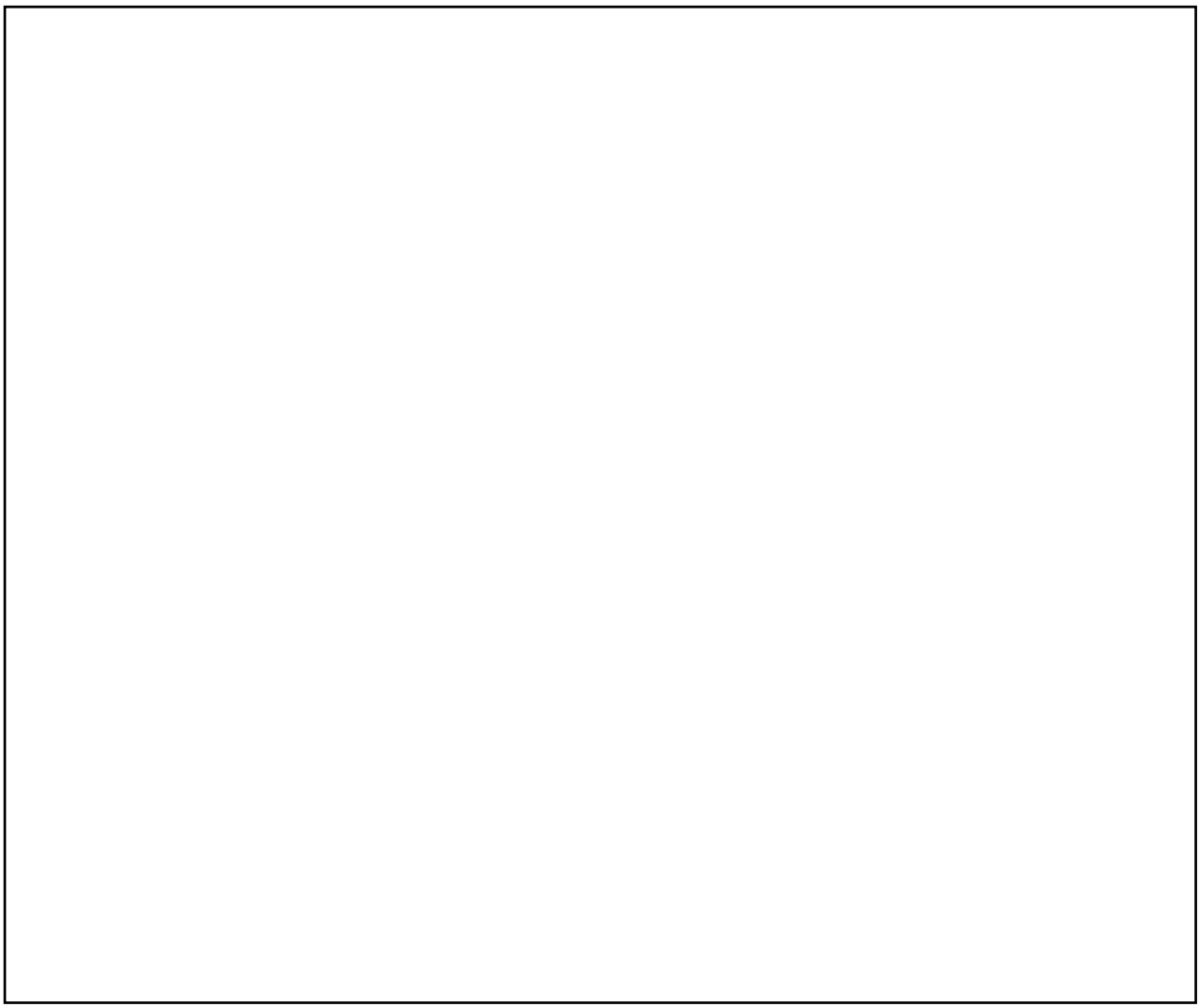
3. Indicate two regions of Portugal where there is evidence of volcanic activity.

_____
_____
_____

4. Mention four socio-economic impacts of volcanic activity in those regions.

_____
_____
_____
_____

5. Draw a sketch of a volcano, labelling the main components of its structure (magma chamber, volcanic conduit, volcanic crater, volcanic cone, etc.).



Supplementary Material B

Domains	Criteria	Performance Levels			
		Insufficient (1)	**Sufficient (2)**	**Good (3)**	**Excellent (4)**
Knowledge (C1)	**Mobilisation of knowledge** (students understand scientific and technological processes, question, research and apply knowledge throughout the VFT)	Do not mobilise knowledge.	Show some knowledge, but have difficulty mobilising it.	Demonstrate knowledge, but apply only some of it.	Master the various scientific knowledge involved.
Problem Solving (C2)	**Interpretation of the field guide questions** (whether students are able to complete the Padlet and answer the field guide questions)	Many difficulties in completing the Padlet and answering the questions.	Some difficulties in completing the Padlet and answering the questions.	The Padlet was completed, and most questions were answered.	The Padlet was completed, and all questions were answered with ease.
	Critical Thinking (students observe, analyse and discuss ideas, critically interpreting information)	Analysis and discussion are superficial or incorrect. No questioning or critical thinking.	Information is interpreted in a basic way, with some errors.	Coherent analysis and interpretation, justifying answers.	Demonstrates deep critical thinking, clearly and coherently relating concepts.
	Creativity (students use imagination to develop digital posters that promote creativity and innovation)	Shows no creativity or imagination in the digital poster.	Shows little creativity and imagination.	Shows some creativity and imagination in the design and organisation.	Presents a very creative, organised, innovative and well-supported poster.
	Autonomy (students plan, execute and evaluate strategies autonomously, demonstrating confidence, resilience and persistence)	Show no autonomy in carrying out the VFT.	Were autonomous but required supervision.	Required little supervision.	Were completely autonomous.
Social Skills (C3)	**Interest and Participation** (whether students demonstrate engagement, interest and participation)	Little participation and interest.	Participate occasionally, with little initiative.	Participate actively and with interest.	Demonstrate high interest and initiative, asking relevant questions.

	Collaborative Work (students work together during the VFT to achieve objectives, valuing diverse perspectives)	No collaboration within the group.	Some collaboration.	Most group members collaborated.	All group members collaborated.

Supplementary Material C

Name: _____ Nº: _____

The application of this snapshot report is part of a research study carried out within the scope of the Professional Practice Initiation, including the Supervised Teaching Practice of the Master's Degree in Teaching Biology and Geology in Lower Secondary and Upper Secondary Education at the Faculty of Sciences of the University of Porto (FCUP). Its aim is to assess the impact of virtual field trips on the consolidation of learning related to volcanism and students' receptiveness towards the methodology and teaching strategies applied throughout the didactic sequence. This document is confidential and all collected information is intended exclusively for this research. Therefore, you are kindly asked to complete it by marking your opinion with an "X". There are no right or wrong answers; your opinion is essential for the development of this study.

1. Have you previously participated in a Virtual Field Trip? **Yes** ☐ **No** ☐

If yes, how many times? _____

In which school year? _____

2. How would you rate the experience of participating in a Virtual Field Trip?

1 – not interesting at all; 2 – slightly interesting; 3 – neutral; 4 – interesting; 5 – very interesting

1	2	3	4	5
☐	☐	☐	☐	☐

3. How would you rate the level of difficulty of the activity?

1 – very difficult; 2 – difficult; 3 – appropriate; 4 – easy; 5 – very easy

1	2	3	4	5
☐	☐	☐	☐	☐

4. Do you consider that this activity contributes to the consolidation of learning related to volcanism in Portugal and its socio-economic impacts?

1 – strongly disagree; 2 – disagree; 3 – neutral; 4 – agree; 5 – strongly agree

1	2	3	4	5
☐	☐	☐	☐	☐

5. Would you participate again in a Virtual Field Trip? **Yes** ☐ **No** ☐

6. What reasons would encourage you to take part in another Virtual Field Trip?

- ☐ Reduced cost
- ☐ Greater accessibility and inclusion
- ☐ Ease of use and interactivity
- ☐ Reduced physical effort
- ☐ Possibility of visiting remote locations far from the school
- ☐ Easier visualisation of concepts and the possibility to review them several times
- ☐ Reduced travel time
- ☐ Other: _____

7. Do you consider that the use of this educational resource allows greater inclusion for students with physical or geographical constraints?

1 – strongly disagree; 2 – disagree; 3 – neutral; 4 – agree; 5 – strongly agree

1	2	3	4	5
☐	☐	☐	☐	☐

8. What were the most interesting aspects of the Virtual Field Trip?

_____

_____

_____

9. What were the main difficulties encountered?

_____

_____

_____

10. What measures could be implemented to improve future virtual field trips?

_____

_____

_____

Thank you very much for your participation!

Supplementary Material D

Name: _____ N.º: _____

Produce a drawing or schematic representation illustrating your understanding of the rock cycle, also known as the lithological cycle.

Supplementary Material E

Name: _____ N.º: _____

The use of snapshot reports forms part of a research project conducted within the scope of Initial Professional Practice, including the Supervised Teaching Practice of the Master's Degree in the Teaching of Biology and Geology in the 3rd Cycle of Basic Education and in Secondary Education at FCUP. Its purpose is to gather information that may assist the trainee teacher in improving her classroom practice and, consequently, contribute to enhanced student learning. This document is confidential, and all information collected is intended exclusively for the present study.
Accordingly, I kindly request that you complete it by marking your opinion with an 'X'. Please be assured that there are no right or wrong answers.

	Yes				No
1.Had you ever taken part in a field lesson before? If yes, in which school year(s) and how many times? _____					
	1	**2**	**3**	**4**	**5**
2. Evaluate the field lesson according to the following parameters: 2.1. Do you consider that the field lesson enabled an understanding of the rock cycle by allowing the mobilisation/application of theoretical knowledge in a more practical way? 1 – strongly disagree; 2 – disagree; 3 – neutral; 4 – agree; 5 – strongly agree.					
2.2. How would you assess your level of motivation for learning through fieldwork? 1 – not at all motivated; 2 – slightly motivated; 3 – neutral; 4 – motivated; 5 – highly motivated.					
2.3. Indicate your level of interest in taking part in a field class again. 1 – not at all interested; 2 – slightly interested; 3 – neutral; 4 – interested; 5 – highly interested.					
2.4. Do you consider that the use of a digital resource during the field class increases motivation and interest in the content? 1 – strongly disagree; 2 – disagree; 3 – neutral; 4 – agree; 5 – strongly agree.					

3. What did you think of the field class as an educational strategy? Reflect on what you liked most, the main difficulties, and any suggestions for improvement.

_____

_____

_____

_____

_____

_____

_____