

DCE I Field Guide

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Leaders:

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Fieldtrip plan:

08:40. DEPARTURE: Monasterio de la Cartuja. Please be punctual.

10:30. Visit to Nerja Caves

14:00. Arrival to Playa de la Herradura, activities and lunch

17:30. Arrival to Granada: Monasterio de la Cartuja

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INSTRUCTIONS FOR NERJA FIELDTRIP

Trip:

A private bus will drive us. The bus is paid by the department.

08:40. DEPARTURE: Monasterio de la Cartuja. Please be punctual.

17:30. RETURN: Monasterio de la Cartuja

Please avoid individual cars.

Materials:

Per person, a printed version of the fieldtrip guide that is in PRADO, pen, colour pencils, ruler, cello tape and an A4 cardboard (the colour is indifferent)

Clothes:

- Comfortable shoes good for wet and irregular ground (hiking boots, sport shoes)
- Comfortable and warm clothes to walk in the field (better bringing extra than missing it later)
- Waterproof coat: it may be wet inside the cave, and it may get cold out in the field

Sun protection:

- Although it is autumn, bring sunscreen and a sun hat in case it's necessary

Food and drink:

- Food or drinks **will not** be provided
- Bring your own lunch and drinks
- Bring a large bottle of water (1.5l) per person

Health issues:

- If you have any health problems, such as allergies, asthma, mobility problems or anything that may affect you during the fieldtrip, please let me know **in advance** and **make sure that you have with you all the medicines you may need.**

I. The Nerja Cave (a karstic feature)

Activity 1.1. Which one of these agents is the most important in the formation of the Nerja cave?

- a) Water b) Wind c) Ice

Activity 1.2. What processes are the most important in the formation of the Nerja Cave?

- a) Dissolution (karstic processes)
b) Erosion
c) Transport
d) Deposition
e) Chemical precipitation of minerals

Activity 1.3. Which one is the most abundant mineral formed in the Nerja Cave?

- a) Salt (NaCl) b) Calcite (CaCO₃) c) Gypsum (CaSO₄)

Activity 1.4. How long does it take for the rain water to filter through the ground into the aquifer and into the cave?

Activity 1.5. Label the figure provided in a separate document using the following words in Spanish: columna, estalactita, estalagmita, lapiaz, dolina, cañón, gruta o galería (cueva), sima (vertical), surgencia (manantial), sumidero, dolina, polje (uvala)

Activity 1.6. After your visit to the Nerja cave, and answering the previous questions, what other places you know that present karstic features?

Activity 1.7. What are the three elements required for a karstic landscape to occur?

II. Playa de la Herradura

Activity 2.1. What types of rocks can we identify in this beach?

- a) Igneous b) Metamorphic c) Sedimentary

Activity 2.2. Find two rocks of a small size (<1cm of diameter) that suffered metamorphism through pressure (schist and slate), and one rock (also < 1cm) that suffered metamorphism through heat (marble) and paste them here with cellophane.

Schist

Slate

Marble

Activity 2.3. In the metamorphic rocks that we have seen at the end of the beach, what are the most outstanding features?

- a) Orientation of grains forming bands
- b) Dissolution (karstic features: lapies, diagonal dissolution marks)
- c) Presence of folds and/or fractures
- d) Large crystals with equal grains
- e) Presence of foliation (lamination caused by pressure)

Activity 2.4. In the large limestone that we have observed at the end of the beach, what are the most outstanding features?

- a) Orientation of grains forming bands
- b) Dissolution (karstic features: lapies, diagonal dissolution marks)
- c) Presence of folds and/or fractures
- d) Large crystals with equal grains
- e) Presence of foliation (lamination caused by pressure)

Activity 2.5. Draw the trajectory of a rock from Sierra Nevada to this beach, both in profile and from a bird point of view, and how the size of the rock will change.

Activity 2.6. In the A4 cardboard that you have brought, draw the following table, including the headings for each row and column.

Then, find one clast of each category, paste it with cellophane to the cardboard in the corresponding spot and describe it. For the boulder category (too large to handle), just check if there are any around, and if there are, then describe them as well.

GRAIN SIZE (Tamaño de grano)	SAMPLE (Muestra)	SPHERICITY (Esfericidad: esférico, elíptico, alargado)	ROUNDNESS (Redondeamiento: angular, subangular, subredondeado, redondeado)	COMPOSITION (Composición: pizarra, esquisto, mármol)
Boulders (bloques) >254mm				
Cobbles (cantos) 64-254mm				
Pebbles (guijarros) 4-64mm				
Granules (gravas) 2-4mm				
Coarse sand (arena gruesa) 0.5-2mm				
Fine sand (arena fina) 0.06-0.5mm				
Silt (limo) <0.06mm				

Activity 2.6. Do you think a fieldtrip is a good type of practical activity to learn and/or to improve the understanding of the contents related to earth sciences? What about for other science disciplines (chemistry, physics, maths, etc)?

Activity 2.7. What parts of the trip you find more interesting for primary education students? Would you include any other activities or any other stops if you did it with 3rd cycle students?