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מכון ויצמן למדע
**Weizmann Institute of Science**
רחובות 76100, ישראל
המחלקה להוראת המדעים
קבוצת מדעי כדור הארץ והסביבה

# Makhtesh Ramon

# A window to the geological history of southern Israel

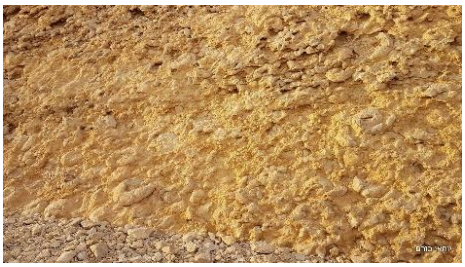
## Nir Orion and Ron Ben Shalom

## 4th GOAL workshop

## January 2020

**The learning stops and expected schedule**

08:30 – Leaving the guesthouse
09:00 – Stop 1: The Ammonite wall
09:45 – Stop 2: The restored quarry
10:30 – Stop 3: The restored Kaolin quarry



# Stop 1: The Ammonite wall

## A. A distant observation

1) Look at the rocks around you. To what group of rocks, do they belong? Explain:

_____

2) What is the geological principle that your above conclusion is based on?

_____

## B. A closer look

1) Approach the exposure and identify the rock that appears here.

| Properties | Observations (circle) | Conclusions |
|---|---|---|
| **Layers** | Exist/not exist If exist: Horizontal/tilted | |
| **Color** | | |
| **Crumbling** | Crumble / non crumble | |
| **Hardness**<br>(Only for a non-crumble rock!) | Can be scratched by:<br>fingernail/ only by iron /not even by iron | |
| **Crushing by teeth**<br>(Only for a crumble rock!) | Ground / non ground | |
| **Mouldability (while wet)** | can be moulded/cannot be moulded | |
| **Reaction to *HCl* (6%)** | Very bubbly /slightly bubbly/ no reaction | |
| **Additional observations** | | |

***Rock's name:*** _____

***Don't forget to take pictures of meaningful phenomena for your report***

2) Are the rock's layers horizontal or tilted? _____

3) What can you conclude from the above observation concerning the layers?

_____

4) What is the geological principle that your above conclusion is based on?

_____

5) Do you identify evidence of ancient life in the rock? If so, try to draw the structure that appears in the rock:

6) What is the formation environment of this rock (circle)?
continental / deep sea / open sea / shallow sea

7) What is the geological principle that your above conclusion is based on?

_____

8) Which stages of the rock cycle might be identified through the observations you made here (circle)? Melting / fast crystallization of a magma / slow crystallization of a magma / uplifting / exposure / erosion / weathering / transportation by wind / transportation by the sea / transportation by river / river sedimentation / dune sedimentation / marine sedimentation / lake sedimentation / cementation / burial /

## C. Earth systems

1) Which relationships between the earth systems: geosphere, hydrosphere, atmosphere and biosphere (including man) might be identified in this stop (including all its four sections)?

_____

_____

_____

## D. Geo-ethics

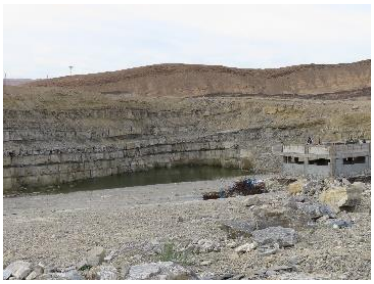
This layer was much more impressive about 40 years ago, but then it became a popular stop for tour guides and visitors took many fossils.

About 1 km along this path there is an ammonites' untouched exposure. The geoparks planners intend to place a sign here that guides hikers to the ammonite outcrop that is up the trail. What do you think about this intention?

_____

_____

_____



# Stop 2: The restored quarry

1) Approach the exposure and identify the rock that appears here.

| Properties | Observations (circle) | Conclusions |
|---|---|---|
| **Layers** | Exist/not exist If exist: Horizontal/tilted | |
| **Color** | | |
| **Crumbling** | Crumble / non crumble | |
| **Hardness**<br>(Only for a non-crumble rock!) | Can be scratched by:<br>fingernail/ only by iron /not even by iron | |
| **Crushing by teeth**<br>(Only for a crumble rock!) | Ground / non ground | |
| **Mouldability (while wet)** | can be moulded/cannot be moulded | |
| **Reaction to *HCl* (6%)** | Very bubbly /slightly bubbly/ no reaction | |
| **Additional observations** | | |

***Rock's name:*** _____

***Don't forget to take pictures of meaningful phenomena for your report***

2. What is the environment formation of the rock? _____

_____

3) What is the geological principle that your above conclusion is based on?

_____

**- Geo-ethics**

1) Why do you think that this quarry was closed? _____

_____

2) Do you like the way that the Geopark planner choose to restore this quarry? If you were a member of the planning team, what would you do differently?

_____

_____

_____

_____

# Stop 3: The restored Kaolin quarry

One of the main components of Geoethics is the ability to communicate with the public.

1. Take about 10 minutes, walk around and then summarize your impression of the geoscience information communicated here.
For example, do you understand the geoscience messages of the signs? Are they clear for the public to understand? Are they related to this specific site? Would you chose to present different or additional messages? Would you do it differently?

_____

_____

_____

_____

Summary question:
In what university courses would you include these field trip stops, to cover the topics that were touched upon?

_____

_____