

ROCK HOUND

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2024

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RULES OVERVIEW

- READ THE RULES.
- Rules are posted on the website at macombso.org.
- The event runs for 30 minutes.
- Students may bring a **8 ½ x 11** chart with them into the event.
- This year's focus is metamorphic rocks and rock forming minerals.
- Teams will be required to identify only those rocks and minerals listed in the rules.

RULE 1

- The test is comprised of 20 stations.
- There will be 1 minute allowed at each station to answer between 4 and 6 multiple choice or true/false questions that will be worth 1-5 points each.
- Answers will be recorded on Zip Grade forms.
- Most stations will have a box with samples inside and the questions attached inside the lid.
- Students will be allowed to handle the samples unless otherwise noted.
- **Some stations will not have samples in the boxes, but they will be asked to answer stand alone questions.**
- **Teams must not open the boxes until told to by the event supervisor.**
- **Teams must close their boxes when told to by the event supervisor**

RULE 2

- The rocks and minerals that the teams need to be able to answer questions about are listed in the rules. These are the ONLY rocks and minerals that they will be asked to identify.
- This year's focus is metamorphic rocks and rock forming minerals.
- Make sure that you are using the current year's rules, because the rocks and minerals used are slightly different.
- To cover this year's focus, 3 new rocks and 3 new minerals have been added to this year's rotation. The rocks are mica-schist, phyllite and staurolite-schist. The minerals are garnet, kyanite and staurolite.
- Permanently added to the list are oolitic limestone and chalcopyrite.
- Though the focus is on metamorphic rocks and associated minerals, do not put an emphasis on them to the exclusion of other rocks and minerals. The test will cover all equally.

Rule 3

- Rock characteristic questions may be about their color, texture, uses, physical characteristics, special properties (reaction to 3 molar hydrochloric acid), **mineral composition** and environments of formation.
- Each category of rock has its own term to describe the type of texture that it exhibits.
- Special properties can refer to reaction to acid, fluorescence, or solubility in solutions.
- Things that are particularly of interest about the rock should be noted.
- Environments of formation refers to the physical circumstances that lead to the formation of that type of rock.

Examples of types of environment of formation

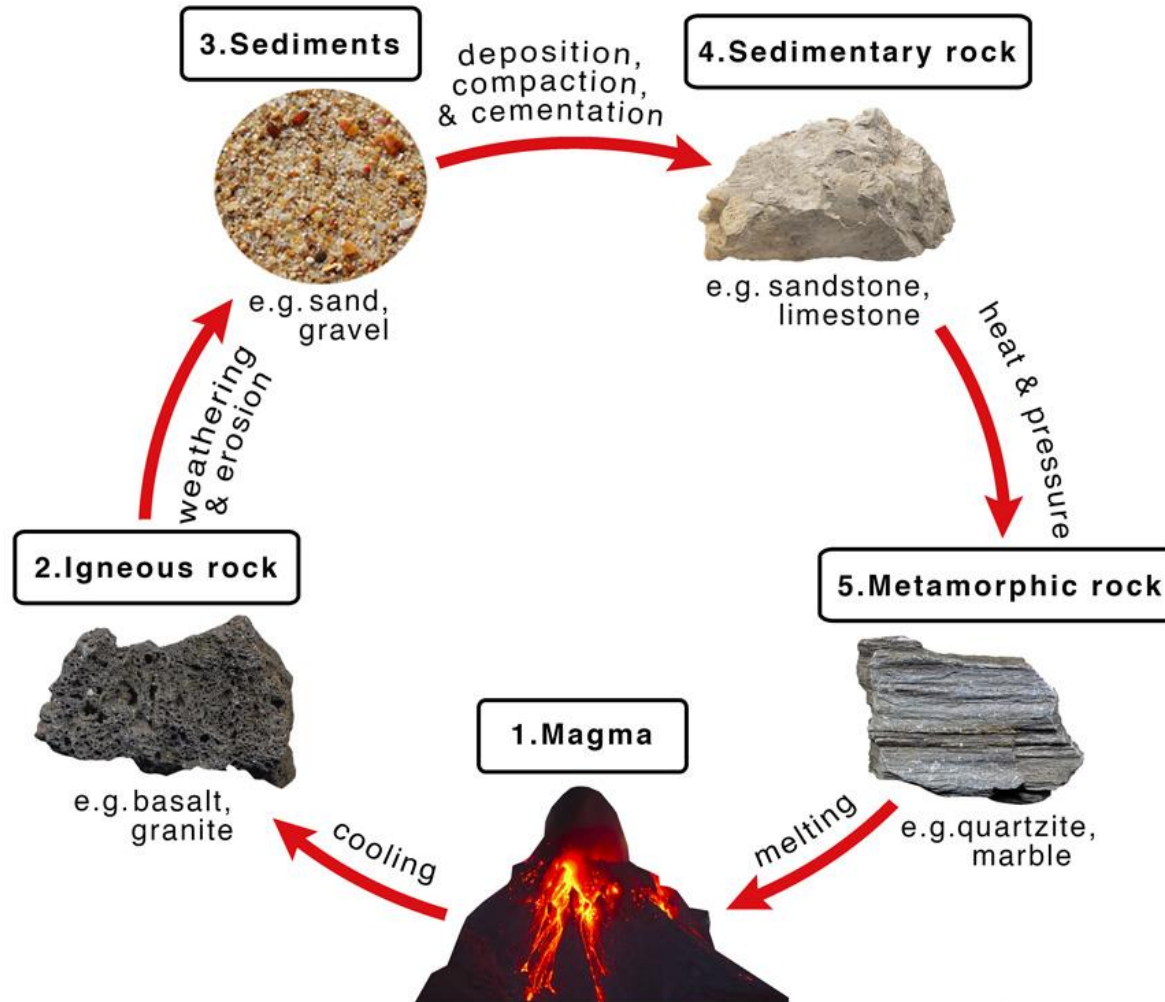
- For igneous rocks, where they are likely to be found in relation to continental or oceanic plates
- For sedimentary rocks, whether they are formed in wet or dry environments and what kind of environment is most likely to produce the rock based on grain shape or size.
- For metamorphic rocks, what type of metamorphism would have produced the rock based on texture and index minerals.
- For minerals, are they evaporates or the result of alteration of other minerals.

Rule 4

- The students also need to have an understanding of the rock cycle. the processes of the formation of igneous (extrusive, intrusive, volcanic glass), sedimentary (erosion, deposition, lithification) and metamorphic rocks. (the effects of heat and pressure on existing rocks).
- The next slide shows an example of the rock cycle.

The rock cycle

Steps of the Rock Cycle



Rule 4 continued

- The students should also understand the processes of the formation of igneous (extrusive, intrusive, volcanic glass), sedimentary (erosion, deposition, lithification) and metamorphic rocks. (the effects of heat and pressure on existing rocks).

Rule 5

- Special questions relating to this year's metamorphic focus may be asked. These could include questions relating to textures (foliated, non-foliated), types of metamorphism (regional, contact, subduction zone and dynamic), factors that control the formation of metamorphic rocks and metamorphic facies and the significance of index minerals in metamorphic rocks.
- Metamorphic facies is a term that refers to a set of mineral assemblages in metamorphic rocks formed under similar pressures and temperatures.
- Index minerals are minerals in metamorphic rocks indicate how much the original rock was metamorphosed, called the grade of metamorphism
- Using these index minerals, you can determine the pressure and temperature ranges that the rock was formed under.

Rule 6

- Mineral characteristic questions may be about their **chemical class**, color, luster, density, relative hardness, reaction to 3 molar hydrochloric acid, crystal shape, texture, cleavage, fracture, special properties (conductivity, fluorescence, optical properties and reaction to flame), uses and environment of formation.
- Native minerals are composed of 1 pure mineral.
- Ex. Copper (Cu) or Graphite(C)
- Chemical class refers to the anion, (the negatively charged ion that usually shows up at the end of the chemical formula of the mineral. For example, the sulfides are based on the sulfur ion, S^{2-} . Pyrite, for example, FeS_2 , is a sulfide mineral.
- **The students do not need to know the chemical formula for the mineral, just the class name.**

Rule 7

- Each team may bring in **1 chart that measures 8 ½ X 11.**
- Both sides may be used.
- Nothing else may be brought in to the testing room

Making the chart

- Prioritize the information that will go on the chart.
- Put information on the chart that can't easily be memorized.
- Teams should make the chart themselves.
- Practice with the chart. The more familiar the teams are with it, the faster they will find the information.
- Find out which team member is more comfortable with the chart, and which is more comfortable filling in the zip grade form.

Coaching tips

- Play to each individual's strength.
- Make sure that they understand the vocabulary.
- If possible, get physical samples .
- Test often and time them.
- Make games
- Make flashcards.
- Assign specific home work.
- Have tem quiz each other.

Competition strategies

- Don't waste time arguing.
- Answer every question, a wrong guess does not count against them.
- Match the question number to the zipgrade.

Resources

- Check with your school to see if they have materials from previous years
- I will be giving 2 workshops. One at on Jan. 27th for adults only at MISD. This will focus on coaching tips.
- One on Feb. 10th at South campus of Macomb Community College for students and coaches.
- Registration is required. Further information can be found on the Macomb Science Olympiad web site
- Some internet sites are <https://geology.com/>
<https://www.mindat.org/> <https://www.galleries.com/>
<https://geologyscience.com/>