Name: _____

# Metamorphic Rocks Table

In the following table is a list of metamorphic rocks. Using the internet/other resources, find out whether the rock is foliated or nonfoliated and what the parent rocks are. A parent rock is the original rock type of the metamorphic rock. Then find the dominant minerals that make up each rock.

| Metamorphic Rock Name | Non-foliated/Foliated | Parent Rock Type/Types | Dominant Minerals |
|---|---|---|---|
| **Marble** | | | |
| **Quartzite** | | | |
| **Hornfels** | | | |
| **Slate** | | | |
| **Phyllite** | | | |
| **Schist** | | | |
| **Gneiss** | | | |
| **Amphibolite** | | | |

1. What do you think some of the driving forces of metamorphism are?

2. Where would you expect to find metamorphic rocks? (What type of environment?)

3. Name one place in the US where you would find metamorphic rocks.

4. What is the difference between regional and contact metamorphism?

5. Explain why a metamorphic rock is or is not likely to contain fossils.

**Metamorphic Rocks Table**
**Answer Key**

In the following table is a list of metamorphic rocks. Using the internet/other resources, find out whether the rock is foliated or nonfoliated and what the parent rocks are. A parent rock is the original rock type of the metamorphic rock. Then find the dominant minerals that make up each rock.

| Metamorphic Rock Name | Non-foliated/Foliated | Parent Rock Type/Types | Dominant Minerals |
|---|---|---|---|
| **Marble** | non-foliated | limestone | Calcite, some garnet, mica, pyrite and graphite |
| **Quartzite** | non-foliated | sandstone | quartz |
| **Hornfels** (this is the most difficult) | Non-foliated, can be foliated though so I accept both answers | Shale, mudstone | Biotite, quartz, feldspar |
| **Slate** | foliated | Shale, mudstone | Mica, quartz |
| **Phyllite** | foliated | Shale and slate are acceptable answers. | Mica, quartz, chlorite |
| **Schist** | foliated | Shale is the base parent rock, however I accept slate, phyllite as well because they also have the parent rock of shale | Mica, quartz, feldspars |
| **Gneiss** | foliated | Shale is the base parent rock, however I accept slate, phyllite, and schist as well because they also the parent rock of shale | Feldspar, quartz are usually the light colored bands and biotite, hornblende, garnet or graphite can be found in the dark bands |
| **Amphibolite** | Weak foliation to non-foliation. I accept both. | Basalt, gabbro, marl, graywacke | Plagioclase feldspar, hornblende |

1. What do you think some of the driving forces of metamorphism are?
    a. Driving forces of metamorphism are, Earth's internal heat, weight of rock above, tectonic forces, mountain building, meteorites impacting the ground.
2. Where would you expect to find metamorphic rocks? (What type of environment?)
    a. Exposed in mountains that have gone through folding and faulting.Name one place in the US where you would find metamorphic rocks.
3. Name one place in the US where you would find metamorphic rocks.
    a. Rocky mountains, Appalachians, Most other mountain ranges would contain them.
4. What is the difference between regional and contact metamorphism?
    a. Regional metamorphism occurs over large area, due to mountain building and plate tectonics.
    b. Contact metamorphism occurs when meteors impact the Earth, magma heats the rock directly.
5. Explain why a metamorphic rock is or is not likely to contain fossils.
    a. The rock has gone through physical changes.
    b. The rock has undergone intensive heat and pressure.
    c. If fossils are found, most likely they will be misshapen.

# Teacher Reflections, Suggestions, and Instructions

- This lesson is a straightforward webquest/internet search.  The main objective is to just get students reading about metamorphic rocks and looking at images.  Can they see a metamorphic rock and know that it is foliated or non-foliated?
- I have students read this page from my website first. http://earthscience.xyz/MetamorphicRocks so they have an understanding of what metamorphism is, what foliated vs non-foliated rocks is all about, and what parent rocks and dominant minerals are.
- The last 5 questions can be discussed at their table groups as these questions will lead us into the whole group discussion about metamorphic rocks.