

1. \_\_\_\_\_ refers to solid-state changes to rocks in Earth's interior.
2. This change is produced by increased \_\_\_\_\_, \_\_\_\_\_, or the action of hot, reactive fluids.
3. Old rocks and/or minerals, unstable under new conditions, \_\_\_\_\_ into stable ones.
4. Metamorphic rocks common in the old, stable cores of continents are known as \_\_\_\_\_.
5. Texture and mineral content of metamorphic rocks depends on the following:
  - a. \_\_\_\_\_
  - b. \_\_\_\_\_
  - c. \_\_\_\_\_
  - d. \_\_\_\_\_
  - e. \_\_\_\_\_
6. **True** or **False** Usually, no new material (except for water) is added to a rock during metamorphism.
7. Where does the temperature (heat) come from that causes metamorphism?
8. All minerals are \_\_\_\_\_ over a finite temperature range. If that range is exceeded, then \_\_\_\_\_ minerals will form. If the temperature gets high enough, then \_\_\_\_\_ will occur.
9. Pressure during metamorphism comes from the immense weight of overlying materials. Pressure is \_\_\_\_\_ to the depth within the Earth and increases at a rate of \_\_\_\_\_ kilobar per \_\_\_\_\_ km of burial within the crust.
10. The (higher/lower) the pressure, the more compact the minerals in a metamorphic rock.
11. \_\_\_\_\_ forces often lead to forces that are not equal in all directions. This is called differential stress.
12. \_\_\_\_\_ stress causes flattening \_\_\_\_\_ to stress.
13. \_\_\_\_\_ causes flattening by sliding \_\_\_\_\_ to stress.
14. Planar rock texture of aligned minerals produced by differential stress is known as \_\_\_\_\_. Foliation increases with pressure and time.
15. Metamorphic rock classification is based on rock texture and includes rocks that are \_\_\_\_\_ (layered) vs. \_\_\_\_\_ (non-layered).
16. Foliated rocks named based on three types of foliation. The three types are:
  - a. \_\_\_\_\_
  - b. \_\_\_\_\_
  - c. \_\_\_\_\_

17. Non-foliated rocks named based on their \_\_\_\_\_.

18. Fluids:

- a. Hot water in the form of water \_\_\_\_\_ is most important.
- b. Rising temperature causes water to be \_\_\_\_\_ from unstable minerals.
- c. Hot water is very reactive; acts as rapid transport agent for mobile \_\_\_\_\_.

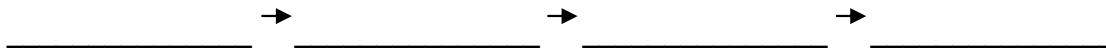
19. Time:

- a. Metamorphism, particularly from high pressures, may take \_\_\_\_\_ of years.
- b. Longer times allow newly stable minerals to grow \_\_\_\_\_ and increases their \_\_\_\_\_.

20. \_\_\_\_\_ metamorphism occurs in rocks that are near a magma body. This type of metamorphism produces (foliated/non-foliated) rocks.

21. \_\_\_\_\_ metamorphism occurs over wide areas and can cause extreme rock alteration and deformation.

22. Name the prograde metamorphism of shale, starting from least foliated to the most foliated.



23. Name the source rock for the following metamorphic rocks:

SOURCE ROCK	METAMORPHIC ROCK
	Slate
	Marble
	Quartzite

24. Partial melting during metamorphism produces \_\_\_\_\_. These rocks exhibit both intrusive \_\_\_\_\_ and foliated metamorphic textures.

25. \_\_\_\_\_ metamorphism is produced by rapid application of extreme pressure. The only force known to do this is from \_\_\_\_\_ impacts.

26. Regional metamorphism is associated with \_\_\_\_\_ plate boundaries.

27. Hydrothermal rock are common near \_\_\_\_\_ plate boundaries.

28. In the case of hydrothermal rocks, water passes through rocks and precipitates \_\_\_\_\_ minerals on walls of cracks and in pore spaces. Metallic ore deposits are often form this way (veins), such as gold and silver deposits.

29. Why is foliation only associated with regional metamorphism (5pts)?

30. Why are metamorphic rocks so limited in the distribution at the Earth's surface (5pts)?