Physical Geology
South Sevier High School
Lecture Notes – Chapter 7

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Name _____
Date _____
Per _____

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)?