

# ROCKS

## Aim 4: What are metamorphic rocks?

### HW from “Reviewing Earth Science, the Physical Setting”

- Read “Metamorphic Rocks” p43&44
- Do all questions on Part A on p44&45

Metamorphic rocks form when igneous, sedimentary, or metamorphic rocks are changed by heat and/or pressure. Metamorphism varies from low to high grade depending on the amount of heat and/or pressure.

Metamorphic rocks are divided on the basis of texture: foliated or nonfoliated.

Foliated means that metamorphic rocks show layers since the crystals are aligned.

Ex: Phyllite

Sometimes minerals separate into bands such as in gneiss.



Nonfoliated means that they do not show layers

Regional metamorphism is the process by which rocks are transformed by pressure and heat deep within Earth over wide regions.

Contact metamorphism is the process by which rocks are transformed at or near Earth's surface as the result of contact with magma or lava.

### Test your understanding

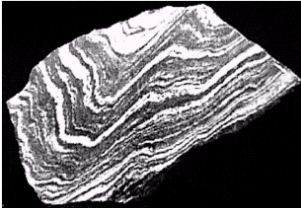
8/07

22 Dolostone is classified as which type of rock?

- (1) land-derived sedimentary rock
- (2) chemically formed sedimentary rock
- (3) foliated metamorphic rock
- (4) nonfoliated metamorphic rock

6/07

Base your answers to questions 62 through 64 on the photograph of a sample of gneiss below.



62 What observable characteristic could be used to identify this rock sample as gneiss?

63 Identify *two* minerals found in gneiss that contain iron and magnesium.

64 A dark-red mineral with a glassy luster was also observed in this gneiss sample. Identify the mineral and state *one* possible use for this mineral.

8/06

32 Wavy bands of light and dark minerals visible in gneiss bedrock probably formed from the

- (1) cementing together of individual mineral grains
- (2) cooling and crystallization of magma
- (3) evaporation of an ancient ocean
- (4) heat and pressure during metamorphism

2004-6

14 Which nonfoliated rock forms only in a zone of contact metamorphism?

- (1) conglomerate
- (3) pegmatite
- (2) hornfels
- (4) quartzite

2004-1

43 Which two rocks have the most similar mineral composition?

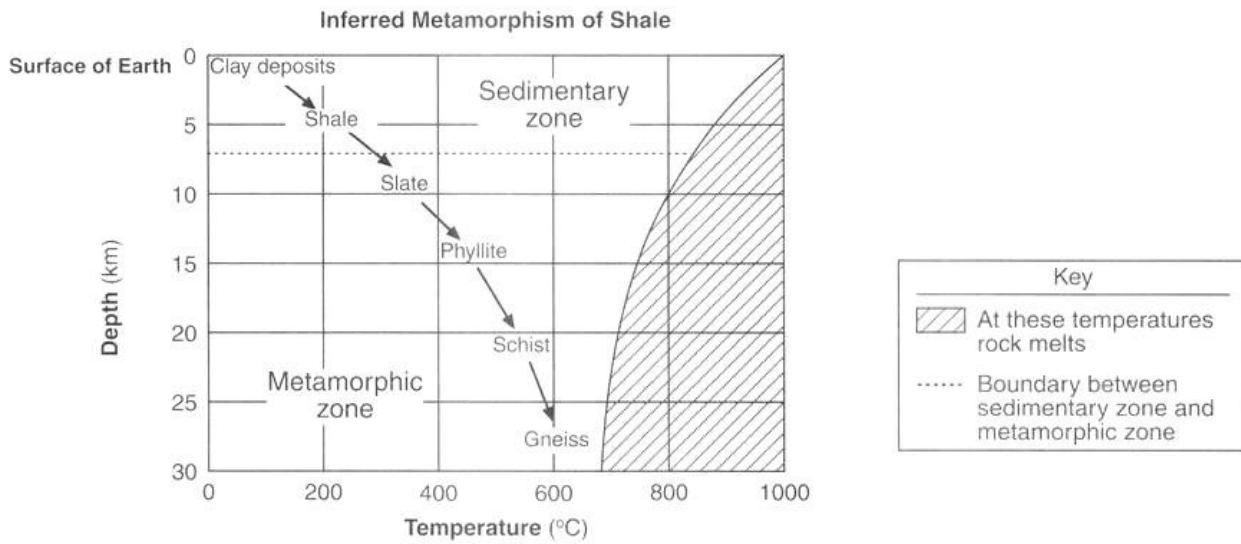
- (1) marble and rhyolite
- (2) limestone and basalt
- (3) quartzite and rock salt
- (4) granite and phyllite

2003-1

35 The diagram below shows a rock with deformed structure and intergrown crystals. The rock was probably formed by

- (1) sediments that were deposited on the ocean floor
- (2) heat and pressure that changed a preexisting rock
- (3) volcanic lava that cooled on Earth's surface
- (4) a meteor impact on Earth's surface

Base your answers to questions 55 and 56 on the graph below, which shows a generalized sequence of rock types that form from original clay deposits at certain depths and temperature conditions within Earth's interior.



55 When clay materials are buried to a depth of 14 kilometers, which type of metamorphic rock is normally formed?

56 Explain why gneiss would not form at a depth of 27 kilometers and at a temperature of 800°C.