**Lesson** – Metamorphic Rocks

THE FOLLOWING **VIDEO** HAS BEEN APPROVED FOR
**ALL AUDIENCES**
BY THE EARTH SCIENCE TEACHERS ASSOCIATION OF AMERICA , INC

THE VIDEO HAS BEEN RATED

| | |
|---|---|
| I | **INTELIGENT** |
| | UNDER 15 REQUIRES TEACHER ASSISTANCE |
| STRONG EARTH SCIENCE LANGUAGE, DETAILED DIAGRAMS, AND SUPER AWESOMENESS | |

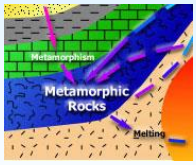
- I can name how a metamorphic rocks form
- I can describe the two types of metamorphism
- I can describe metamorphic rock textures

# Metamorphic Rocks


Rocks that form from HEAT and PRESSURE during a process called **metamorphism**.

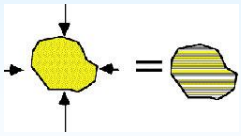
**Fascinating Fact**

The oldest rock is the Acasta gneiss (3.96 billion years old). It is a metamorphic rock found in Canada.

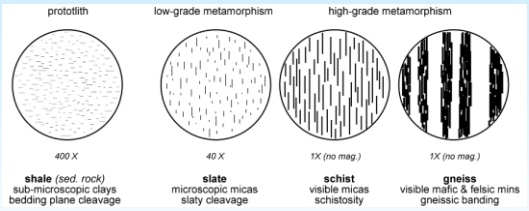



# Metamorphism

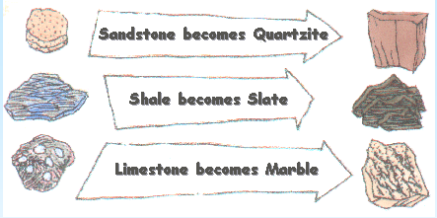
- Rocks that have gone through metamorphism
  - less porous and more dense
  - larger crystals (Recrystalization)



# Animated View of Metamorphism




http://www.classzone.com/books/earth_science/terc/content/visualizations/es0607/es0607page01.cfm?chapter_no=visualization

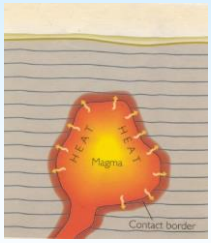



Did you know that the Taj Mahal built between 1632 and 1654 in India is made entirely out of marble?

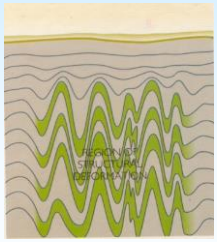
Don't Write

## Types of Metamorphism

Contact Metamorphism (small area)



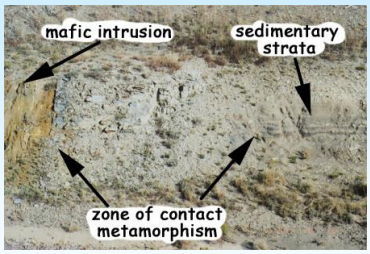

Regional Metamorphism (large area)



## Contact Metamorphism

- When older rocks come in contact with the **heat** from **magma** or **lava**
  - One **igneous** rock comes between **sedimentary** rocks
  - Small area

## I-25 Just North Of Las Vegas

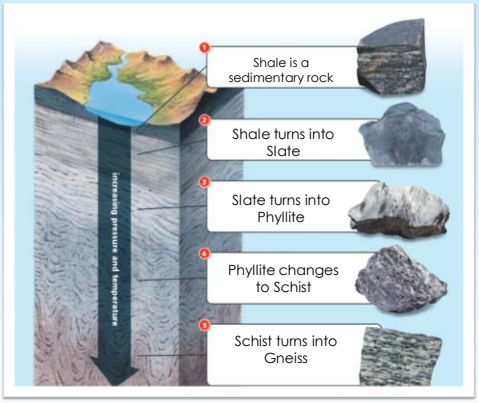



20 Feet

## Regional Metamorphism

- Usually occurs at plate boundaries
- Large area

Mountain range in Alaska

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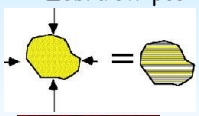
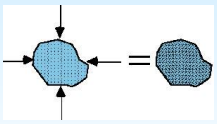
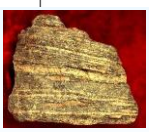
# Metamorphic Rock Textures

- Foliated
  - Show layers of minerals
  - Zebra stripes
- Non-Foliated
  - Have no layering of minerals







← Gneiss

Marble →

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Scheme for Metamorphic Rock Identification ESRT Pg 7

| TEXTURE | | GRAIN SIZE | COMPOSITION | TYPE OF METAMORPHISM | COMMENTS | ROCK NAME | MAP SYMBOL |
|---|---|---|---|---|---|---|---|
| FOLIATED | MINERAL ALIGNMENT | Fine | MICA, QUARTZ, FELDSPAR, AMPHIBOLE, GARNET, PYROXENE | Regional (Heat and pressure increases) | Low-grade metamorphism of shale | Slate | |
| | | Fine to medium | | | Foliation surfaces shiny from microscopic mica crystals | Phyllite | |
| | | | | | Platy mica crystals visible from metamorphism of clay or feldspars | Schist | |
| | BANDING | Medium to coarse | | | High-grade metamorphism; mineral types segregated into bands | Gneiss | |
| NONFOLIATED | | Fine | Carbon | Regional | Metamorphism of bituminous coal | Anthracite coal | |
| | | Fine | Various minerals | Contact (heat) | Various rocks changed by heat from nearby magma/lava | Hornfels | |
| | | Fine to coarse | Quartz | Regional or contact | Metamorphism of quartz sandstone | Quartzite | |
| | | | Calcite and/or dolomite | | Metamorphism of limestone or dolostone | Marble | |
| | | Coarse | Various minerals | | Pebbles may be distorted or stretched | Metaconglomerate | |

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Which sequence of change in rock type occurs as shale is subjected to increasing heat and pressure?

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What rock has a foliated texture & contains the minerals amphible, quartz, & feldspar in coarse-grained bands?

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- I can use the Metamorphic Rock Chart