

Metamorphic Rocks – Basement of Parashant

Geological Adventures at Parashant
Lesson 4



Objectives

- Metamorphism changes one kind of rock into another kind of rock.
- Several ways that heat and pressure change rocks.
- Metamorphic rocks are derived from and related to other rocks.
- Why metamorphic rocks form the basement rocks of Parashant.



Materials and Set Up



Figure 1. Materials needed for the activity.



Figure 2 Slicing the end of the model to make a clean face. Save scraps for later lessons.





Figure 3 Side view (length), end view (width), and height of clay model prior to it being compressed.

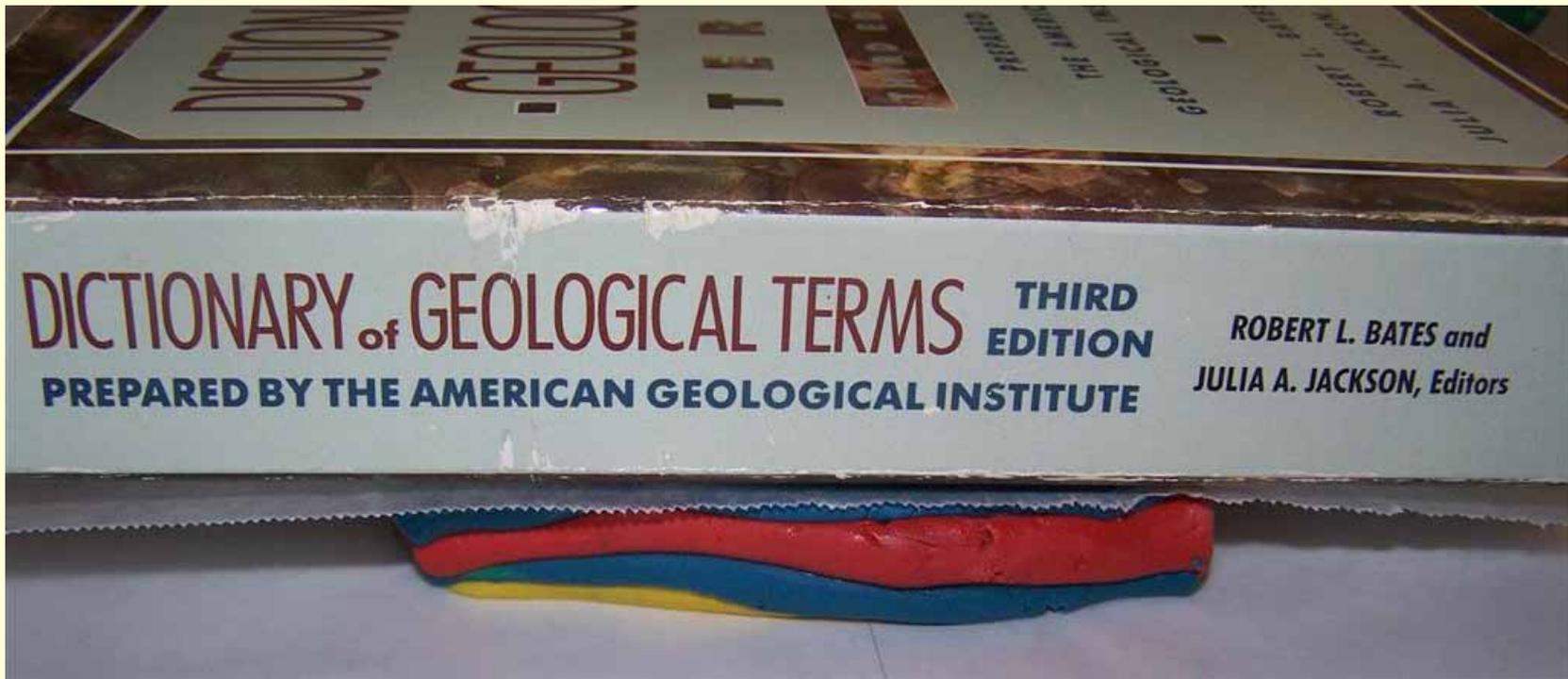


Figure 4 Model after being compressed by a book.



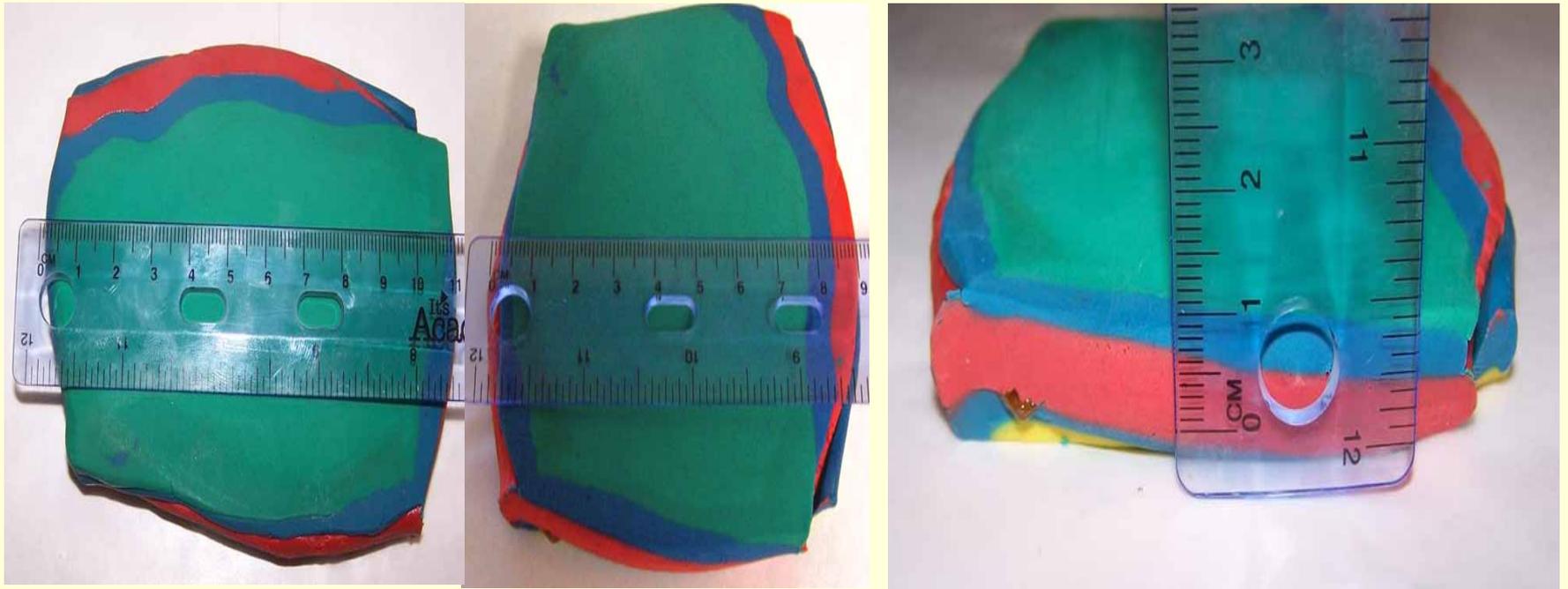


Figure 5 Clay model after being compressed, showing length, width, and height.





Figure 6 Side view of model after folding.

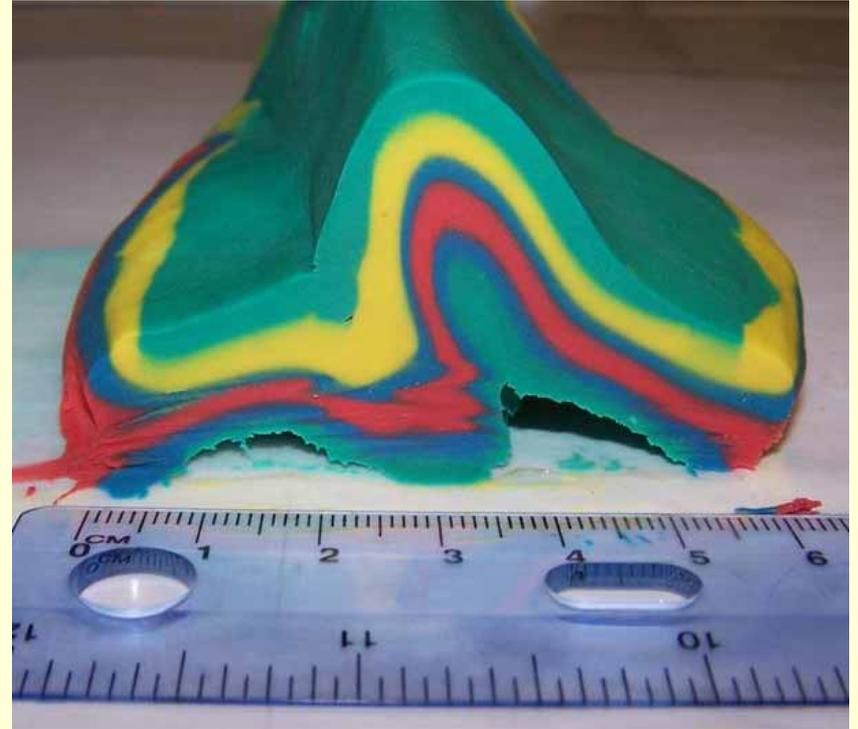


Figure 7 Side view of sliced model after folding.

Table 1. Changing Dimensions of a Clay Model of Metamorphic Rock

Time	Length (cm)	Width (cm)	Height (cm)
Before Pressure is Applied			
After Pressure is Applied			
Change (+ or -)			



Table 2. Metamorphic Rock Identification Chart

Texture	Composition; Color, and Features	Parent Rock	Rock Name
Foliated - very fine grained- no visible minerals	Dull; Rings when struck on desk.	Shale or mudstone	Slate
	Shiny due to increased size of mica minerals (almost see them)	Shale or mudstone	Phyllite
Foliated - medium to coarse grain	Individual mineral grains visible	Slate	Schist
Color banded	Alternating layers of light (felsic) and dark (mafic) minerals	Schist	Gneiss
Non-foliated with non-oriented grains	Calcite; Light; Softer than glass; Reacts with hydrochloric acid	Limestone or Dolomite	Marble
	Carbon; Dark; Shiny; Breaks with a conchoidal fracture	Bituminous coal	Anthracite coal
	Quartz; Light to dark; Harder than glass	Sandstone	Quartzite





FIGURE 4.1 Metamorphic rocks form the core of the Virgin Mountains at Parashant.





FIGURE 4.2 Heat and pressure cause minerals to become foliated or banded during metamorphism.





FIGURE 4.3 How do the folds in this gneiss compare with the folds in your clay model?





FIGURE 4.4 The change in color at the top of the red sandstone caused when hot molten lava (now a layer of black basalt) flowed over it is due to contact metamorphism.





FIGURE 4.5 Metamorphic rocks in the Virgin Mountains were exposed by uplift and erosion. Note how the rocks are turned on end.





FIGURE 4.6 Schist at Parashant. Penny for scale.



FIGURE 4.7 Gneiss at Parashant. Penny for scale.





FIGURE 4.8 Metamorphic rock from the Virgin Mountains at Parashant (penny for scale).

