

Reading Guide for September 15

Yes, this is a ton of reading. It will take some time no matter what. Follow these guidelines to focus your efforts for the most benefit.

from Cvancara, *Field Manual for the Amateur Geologist*

Chapter 14. Minerals

For the most part, read through this chapter once, and quickly. You can even safely skim and skip. Identification of particular minerals is beyond the scope of this course. The section that I'd like you to pay particular attention to is the last.

p. 176. Formation of Minerals. The minerals present in a rock tell us something about the conditions at which the rock formed.

- Where are **magnetite** crystals typically deposited?
- What about **feldspar** crystals?
- What does the presence of **staurolite** or **garnet** tell about the history of a rock?

Chapter 15. Igneous Rocks

pp. 178–179. *Main Igneous Rock-Forming Minerals*. Note the distinction made between these two broad categories. What is the point? The mix of different types of minerals allows us to classify igneous rocks. The point of *that* is that the rock type tells *how* a rock formed, *where* it formed, and where its *source magma* originated. This helps us reconstruct the history of the land.

pp. 179–188. *Classifying and Identifying Igneous Rocks*. This is the meat of the chapter. It tells you how to categorize igneous rocks based on their mineral composition and texture. To a large extent, the test of this section is an extended caption to table 15-1. Read along with this, look at the photographs, and be prepared to classify actual samples of rock in class.

pp. 188–194. *Occurrence of Igneous Rocks*. This section tells the landforms and visible features resulting from igneous activity. Some are intrinsically surface features, while some are created at depth and only much later exposed at the surface by erosion.

- Define and distinguish **intrusive** and **extrusive** igneous rocks.
- Compare and contrast **dikes** and **sills**.
- How do **laccoliths**, **batholiths**, and **stocks** form?

Chapter 16. Sedimentary Rocks

p. 195. *Main Sedimentary Rock-Forming Minerals*. This short section is beyond the scope of this course.

pp. 195–209. *Classification, Identification, and Origin of Sedimentary Rock*. The key information in this long section is summarized in Tables 16-1 and 16-2. In this course, most of the sedimentary rock identification you will do will rely on Table 16-1, though you will look at limestones.

pp. 197–201. “*Clastic Rocks*.” This is effectively an extended caption to table 16-1. Read this to prepare you to classify clastic sedimentary rocks that you encounter.

p. 201. “*Origin of Clastic Rocks*.” Read this through once.

pp. 201–209. “*Nonclastic Rocks*.” Read this section mainly to get a feel for the great variety of these rocks, and how they are created.

pp. 209–213. *Sedimentary Rock Structures*. Interesting as these are, this material is beyond the scope of this course.

Chapter 17. Metamorphic Rocks

This chapter is brief, although about half the crystalline rocks exposed at the Earth’s surface are metamorphic. The parent materials of metamorphic rocks are sedimentary or igneous rocks. The greater the pressure and temperature to which the rocks are subjected in metamorphism, the higher the resulting rock’s metamorphic grade. The higher the metamorphic grade, the more difficult it is to identify the parent material.

p. 214. *Main Metamorphic Rock-Forming Minerals*. The most critical information in this short section is the short list of minerals that characterize metamorphic rocks. Identifying these minerals in rocks helps to classify the rock as metamorphic.

pp. 214–219. *Classifying and Identifying Metamorphic Rocks*. This section is an extended caption to table 17-1. Read it to help you identify metamorphic rocks you will encounter.

p. 219–222. *Origin of Metamorphic Rocks*. This is the more interesting section of the chapter, as it explains how metamorphism occurs.

pp. 219–220. “*Agents of Metamorphism*.” This subsection lists three agents and explains their effects. Get an idea how each changes the character of the rock it works upon.

pp. 220–222. “*Kinds of Metamorphism*.” This describes three types of metamorphism. Don’t worry about which particular rock types are formed by each process; instead focus on how and where the processes occur.