

**Reading Guide for
Plate Tectonics**

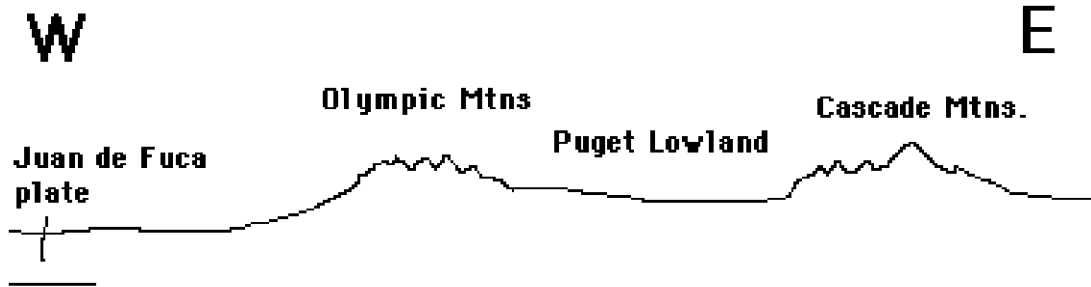
Chapter 1: Plate Tectonics (p. 21)

You should have read this section during the first week of the quarter. You should re-read this section and review the basic concepts of plate tectonics and the fundamental types of plate boundaries.

Divergent Plate Boundaries are where plates _____. A current example of a divergent boundary is _____.

Convergence of two plates of different densities creates a _____ zone. A current example of convergent boundary is _____.

On page 26, Figure 1-28 illustrates the subduction zone along the western part of North America. Using that illustration, draw the cross section below of the subduction zone along the Washington coast.



When plates move horizontal past each other, this is termed a _____ boundary.

In Support of Plate Tectonics: A Theory Develops (p.29)

Alfred Wegener and Continental Drift (p.29)

List and briefly explain the five major types of supporting types of evidence that Wegener used to support his continental drift hypothesis.

1)

2)

3)

4)

5)

The Driving Force Behind Plate Motion (p.34)

You will not be tested on this section.

Ch. 3: Igneous Rocks and Processes

Earlier this quarter you read most of chapters 3 and 4, but we did not cover the origin of magmas at that point. The sections below will help you understand how magmas form.

Melting Rocks and Crystallizing Magma (p. 72)

The Creation of Magma (p. 73)

When rocks melt, does the entire rock melt at one temperature? Why or why not?

Explain partial melting.

The authors define three primary factors that determine the melting of rocks (other than the composition). What are these three factors and how do they increase or decrease the likelihood of a rock melting?

Plate Tectonics and Igneous Rock (p. 90)

The Origin of Basalts and Gabbros (p. 91)

Basalts are grouped into two categories, oceanic and continental basalts. What are some important differences in these two groups of basalts?

Explain how andesites and diorites form.

Ch. 12: Plate Tectonics and the Formation of the Earth's Oceans (p. 384)

Please read the section "Some Plate-Tectonic Basics (p. 386)."

The Nature and Origin of the Ocean Floor (p.386)

Rifting and the Origin of Ocean Basins (p.387)

What is a failed rift? What is an example of a failed rift?

What is a passive continental margin? Where is there a passive continental margin today?

Divergent Plate Boundaries (p.391)

In what ways do the mid-ocean ridges of the world differ from other mountain systems on land?

(Please go to pages 90-94 (ch.3) and read the section entitled "Plate Tectonics and Igneous Rock". This was a section you did not have to read for unit 1, so it is possible that it is new information for you.)

What is an ophiolite? What types of rocks comprise an ophiolite?

Please read "Highlight 12-1" on page 392.

Transform Boundaries and Offset Mid-ocean Ridges (p.394)

What is a transform boundary? Is volcanism common at transform plate boundaries? Give an example of a transform plate boundary.

Convergent Plate Boundaries—Subduction Zones (p.394)

What does subduction mean? Why is the oceanic crust subducted as it converges with continental crust?

You should be familiar with the following features of convergent plate boundaries and how they help us identify the location of convergence:

oceanic trench, melange, accretionary wedge, volcanic arc

What determines the angle of the subducting oceanic plate? How does this determine the *arc-trench gap*?

Convergence Plate Boundaries—Collision Zones (p.397)

What is a suture zone? What happens when two continental plate converge? What is an example of this type of plates boundary?

Determining Plate Velocity (p. 398)

If you will recall from our river lab, we determined the velocities of the streams by measuring the time it took for an object to float 100 feet. For plate movements we may use external benchmarks, such as a satellite, or determine the velocities relative to another plate.

What is the difference between absolute and relative velocities?

What is the basic concept behind GPS? Explain its use in measuring plate motion. Is this relative or absolute motion?

What is a hot spot?

What happens when a plate moves over the top of a hot spot? Illustrate this idea below. How would the distribution of hot spots tell us about the velocity of the plate?

What is a “marine magnetic anomaly?” In what ways do these anomalies help provide evidence to support plate tectonics? How can we use these anomalies to determine the velocity of a plate? *(see question 8 under “Questions for Review” on page 408.)**

Chapter 13 (p. 410)

The Origin and Shaping of Continents (p.410)

What is a continental shield? a craton?

The Origin of Continents (p.412)

In summary, how did the continents form?

If you have time, read the pages from pp. 414-423, however you will not be tested on them.

The Changing Shape of the Earth's Continents (p.423)

What is a terrane? This is an important topic in the geology of the Pacific Northwest. This idea helps us explain much of the history of the NW.