The textbook for EAS 100, *Foundations of Earth Science*, by Lutgens and Tarbuck is an excellent book. It is up-to-date, "readable", has good illustrations and an appropriate treatment of the four subject areas - Earth Science, Oceanography, Atmospheric Science, and Astronomy - which constitute the subject matter for EAS 100. The book is of appropriate length for a one-semester course and the authors make an attempt to emphasize and identify fundamental concepts and terms and to illustrate these concepts with relevant and significant examples. Despite the quality of this textbook, the reader may "get lost" in the volume of material and in the detailed and extensive terminology that is used in the book and that is somewhat characteristic of these subject areas. This detail and terminology is necessary in a textbook in order for the book to be complete, authoritative, and useful as a reference. An example of this detail is the use of key terms (in bold print in the chapters and listed at the end of each chapter) which tend to confuse and divert the reader from developing an understanding of the material based on the significant concepts and principles in the chapters. Therefore, we suggest that the reader not try to memorize key terms, definitions or details. **The most effective way to study the material covered in EAS 100 using the textbook will be to use this Study Guide during your reading and review.** The Chapter in Review section at the end of each chapter will also be useful in reviewing the chapter.

The following study guide is intended to provide a list of the most important **concepts and principles** (on the left) and (a small number of)** key words** (on the right) which should be emphasized in reading the chapters of the textbook for EAS 100. In addition, the most important **Focus on Learning** questions (at the beginning of each chapter), **Figures to Study**, and **Questions for Review** for each chapter are also listed. The **Focus on Learning** questions at the beginning of each chapter can be considered to be the main learning objectives for the chapter. **The Chapter in Review** section also provides a convenient synopsis of the chapter for study after reading the chapter.

**In EAS 100, we will cover only a portion of the book as given in the assigned reading in the Course Outline.** This Study Guide covers all of the chapters in the book. In addition, Pearson Prentice Hall provides internet access to a *Foundations of Earth Science* website ([http://www.mygeoscienceplace.com/](http://www.mygeoscienceplace.com/)) that contains quizzes for review, the Pearson eText, animations, and *GEODe: Earth Science*, formerly (4th and 5th editions) available in CD format. The GEODe also provides additional opportunities for study and learning. To access the online resources, go to the mygeoscienceplace website and log in using the access code included on the first page (inside the front cover) of your 6th edition book.

**INTRODUCTION (p. 1)**

**Focus on Learning:** 1, 2, 3, 4, 5, 6, 7

- The Earth Sciences
- Earth as a System
- Scales of Space and Time
- Resources and Environmental Issues
- Scientific Inquiry, Scientific Method
- Hypothesis
- Theory
UNIT 1 - EARTH MATERIALS

Chapter 1 - Minerals: Building Blocks of Rocks (p. 20)

Focus on Learning: 1, 2, 3, 4, 6

Minerals
Isotopes and Radioactivity
Properties of Minerals

Mineral
Radioactivity
Silicate
Silicon-Oxygen tetrahedron

Figures to Study: 1.2, 1.3, 1.8, 1.15, 1.16, 1.17, 1.21, 1.22, 1.23
Review Questions: 6, 11, 12, 13, 14

UNIT 2 – SCULPTURING EARTH'S SURFACE

Chapter 2 - Rocks: Materials of the Lithosphere (p. 42)

Focus on Learning: 1, 2

Rock cycle
Igneous, Sedimentary, Metamorphic Rocks
Rock classification

Magma
Weathering
Metamorphism
Mineral composition

Figures to Study: 2.2, 2.4, 2.9, 2.10, 2.18, 2.19, 2.27, 230, 2.31, 2.33
Review Questions: 4, 9, 14, 19

Chapter 3 - Landscapes Fashioned by Water (p. 72)

Focus on Learning: 4, 5, 9, 10, 12

Water (Hydrologic) Cycle
Running Water
Floods
Groundwater

Mass Wasting
Erosion
Deposition
Deltas
Porosity
Aquifer

Figures to Study: 3.1, 3.4, 3.6, 3.7, 3.11, 3.13, 3.17, 3.19, 3.21, 3.23, 3.26, 3.28, 3.30, 3.39, 3.43
Review Questions: 4, 6, 17, 19, 21
Chapter 4 - Glacial and Arid Landscapes (p. 110)

Focus on Learning: 1, 4, 5, 6, 9

Glaciers
Glacial Deposits
Ice Ages
Deserts

Till
Moraine
Drift
Loess

Figures to Study: 4.2, 4.5, 4.9, 4.11, 4.13, 4.15, 4.16, 4.20, 4.22, 4.34
Review Questions: 2, 6, 8, 14, 18

UNIT 3 – FORCES WITHIN

Chapter 5 - Plate Tectonics: A Scientific Theory Unfolds (p. 140)

Focus on Learning: 1, 2, 3, 4, 5, 6, 7

Plate Boundaries
Plate Tectonics
Seafloor Spreading
The Driving Mechanism
Continental Drift
Divergent
Convergent
Transform
Rift
Hot Spots
Convection Currents

Figures to Study: 5.2, 5.3, 5.4, 5.6, 5.7, 5.8, 5.9, 5.10, 5.11, 5.12, 5.13, 5.14, 5.15, 5.16,
5.17, 5.18, 5.19, 5.20, 5.22, 5.24, 5.25, 5.26, 5.27, 5.28, 5.29, 5.30, 5.31, 5.32
Review Questions: 4, 5, 9, 10, 11, 12, 13, 14, 19, 20, 21

Chapter 6 - Restless Earth: Earthquakes, Geologic Structures, and Mountain Building (p. 170)

Focus on Learning: 1, 2, 3, 4, 5, 6, 7, 8, 10

Elastic Rebound Theory
P, S, Surface Waves
Earth's Interior Structure
Accretion
Earthquake
Faults
Magnitude
Tsunamis
Lithosphere
Asthenosphere
Mantle
Core

Figures to Study: 6.2, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 6.10, 6.11, 6.12, 6.16, 6.17, 6.18, 6.19,
6.22, 6.25, 6.26, 6.33, 6.35, 6.36, 6.37, 6.39, 6.41, 6.42
Review Questions: 1, 4, 7, 10, 11, 12, 14, 19, 21, 23, 24

Chapter 7 - Fires Within: Igneous Activity (p. 206)

Focus on Learning: 1, 2, 3, 5, 6
Volcanic Eruptions
Volcano Types
Volcanic Composition

Viscosity
Shield Volcanoes
Composite Volcanoes
Magma
Caldera
Pyroclastics

Figures to Study:  7.1, 7.5, 7.8, 7.9, 7.10, 7.13, 7.17, 7.18, 7.20, 7.22, 7.29
Review Questions:  3, 9, 10, 19, 21, 22, 27, 28

UNIT 4 - DECIPHERING EARTH'S HISTORY

Chapter 8 - Geologic Time (p. 236)

Focus on Learning:  1, 2, 3, 4, 5, 6, 7

Catastrophism
Uniformitarianism
Fossil correlation
Radiometric Dating
Geologic Time Scale
(Pre-Cambrian, Paleozoic, Mesozoic, Cenozoic)

Relative Dating
Absolute Date
Superposition
Horizontality
Cross-Cutting Relationships
Unconformities
Index Fossils
Radioactivity
Half-Life

Figures to Study:  8.3, 8.5, 8.7, 8.10, 8.11, 8.12, 8.13, 8.14, 8.16, 8.18
Review Questions:  1, 2, 3, 14

UNIT 5 - THE GLOBAL OCEAN

Chapter 9 - Oceans: The Last Frontier (p. 258)

Focus on Learning:  2, 3, 5, 6, 7

Composition of Seawater
Ocean Bathymetry

Continental Shelf
Continental Slope
Abyssal Plain
Mid-Ocean Ridge
Atolls

Review Questions:  4, 8, 11, 14, 17, 19

Chapter 10 - The Restless Ocean (p. 280)

Focus on Learning:  1, 2, 3, 4, 6, 7, 8

Ocean Circulation, Currents
Shoreline Processes

Coriolis Effect
Upwelling
Tides
Waves
Longshore Currents

Figures to Study: 10.2, 10.3, 10.6, 10.8, 10.9, 10.12, 10.16, 10.22, 10.23, 10.24, 10.25, 20.26, 10.27
Review Questions: 1, 3, 4, 5, 11, 15, 20

UNIT 6 - THE ATMOSPHERE

Chapter 11 - Heating the Atmosphere (p. 308)

Focus on Learning: 1, 2, 3, 4, 5, 6, 7, 9, 10, 11

Composition of the Atmosphere  Weather
Structure of the Atmosphere  Climate
Cause of Seasons  Rotation
Electromagnetic Radiation  Revolution
Greenhouse Effect  Radiation
Global Warming  Conduction

Review Questions: 1, 4, 5, 9, 12, 14, 15, 17, 19

Chapter 12 – Moisture, Clouds, and Precipitation (p. 340)

Focus on Learning: 1, 4, 5, 9

Precipitation  Latent Heat
Condensation  Humidity
Evaporation
Adiabatic Cooling

Figures to Study: 12.2, 12.10, 12.11, 12.12, 12.13
Review Questions: 1, 8, 9, 13, 15

Chapter 13 - The Atmosphere in Motion (p. 370)

Focus on Learning: 1, 2, 3, 4, 5

Atmospheric Circulation  Air Pressure
High and Low Pressure Systems  Wind
Gradient
Coriolis Effect

Review Questions: 4, 5, 6, 9, 10

Chapter 14 - Weather Patterns and Severe Weather (p. 390)
UNIT 7 - EARTH'S PLACE IN THE UNIVERSE

Chapter 15 - The Nature of the Solar System (p. 418)

Focus on Learning: 1, 2, 3, 4, 5, 6, 7

Planets
Origin of the Solar System
Earth's Moon

Asteroids
Impact Craters
Astronomical Units
Terrestrial

Figures to Study: 15.10, 15.13, 15.14, 15.16, 15.17, 15.18, 15.19, 15.20, 15.21, 15.23, 15.25, 15.28, 15.30, 15.34, 15.36, 15.37, 15.41, 15.42, 15.46

Review Questions: 6, 9, 12, 13, 16

Chapter 16 - Beyond the Solar System (p. 456)

Focus on Learning: 1, 2, 3, 5, 6, 8, 9, 10

Measuring Distances
Hertzsprung-Russell Diagram
Stellar Evolution
Galaxies
Big Bang Theory

Stellar Parallax
Light Year
Apparent Magnitude
Absolute Magnitude
Red Shift
Doppler Effect
Hubble's Law


Review Questions: 1, 2, 3, 5, 8, 10, 20, 25