Introduction: The textbook for the EAPS 10000 Planet Earth course, *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 (geology), Oceanography, Atmospheric Science, and Astronomy - which constitute the subject matter for EAPS 10000. 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 in the Concepts in Review section for 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 most key terms, definitions or details. You will see some terms (such as the ones shown on the list on the right in the chapter summaries below) so often that you will automatically learn their meaning or definition. The most effective way to study the material covered in EAPS 10000 using the textbook will be to use this Study Guide (note the key concepts and key terms in the study guide for each chapter) during your reading and review. Taking your own notes in class or in the reading of each chapter has also been shown to increase learning (https://er.educause.edu/articles/2015/8/promoting-engagement-in-larger-classes). The Retrieval-based Learning method (http://thelearningcoach.com/learning/retrieval-cues-and-learning/) is also recommended for study. Concepts in Review section at the end of each chapter will also be useful in reviewing the chapter.

Additional Information about the Foundations of Earth Science textbook (By Frederick K. Lutgens, Edward J. Tarbuck, Dennis G. Tasa), 8th edition: There are two versions of the 8th edition – content, chapters and page numbers are the same in both versions. The only difference is that one version includes online access to MasteringGeology (access code included in a new textbook). The access code is not required for any reading or assignments in the EAPS 10000 Planet Earth lecture or online courses. The ISBN numbers are listed below. You can also obtain the textbook (new or used copies) from bookstores or online. The text can also be rented or you can purchase access to an eText.
Pearson Foundations of Earth Science website:

Purchase Info
ISBN-10: 0-13-416619-1
Format: Book
$187.20 | Free Ground Shipping.
The access code is not required for any reading or assignments in the EAPS 10000 Planet Earth lecture or online courses.

2. Foundations of Earth Science, 8th Edition, text only, no access code
Purchase Info

Additional resource from Pearson: GEODe CD online:

3. Pearson Foundations of Earth Science (no access code) from Amazon website:
https://www.amazon.com/Foundations-Earth-Science-Frederick-Lutgens/dp/0134184815/ref=sr_1_1?s=books&ie=UTF8&qid=1471204484&sr=1-1&keywords=foundations+of+earth+science
ISBN-10: 0134184815
$170.24

Study Guide (L. Braille): The following study guide (below) 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 EAPS 10000. In addition, the most important Focus on Concepts (at the beginning of each chapter), Figures to Study, and Questions for Review (Give it Some Thought) for each chapter are also listed. The Focus on Concepts at the beginning of each chapter contain most of the main learning objectives for the chapter. The Concepts in Review section also provides a convenient synopsis of the chapter for study after reading the chapter.

In EAPS 10000, we will cover only a portion of certain chapters of the book as given in the assigned reading in the Syllabus. 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 (requires an access code from your textbook, http://www.mygeoscienceplace.com/) that contains quizzes for review, and the Pearson eText, animations. 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 8th edition book. The access code is not required for any reading or assignments in the EAPS 10000 Planet Earth lecture or online courses. There are links on some of the Figures (called SmartFigures; see icon below that appears next to the smart figures) that allow you to connect to animations (using phone app BouncePage; see instructions on page xviii).
Additional information on recommended methods of study: Two methods of study that have recently been shown to be effective are Retrieval-based Learning (RBL) and taking notes (in class or during your reading – yes, that’s what seems to be a “lost art” in this age of technology, electronic devices, and PowerPoint slides that are almost always made available to students!). More information on Retrieval-based Learning (and references) can be found at: http://theelearningcoach.com/learning/retrieval-cues-and-learning/. More information (and evidence) on the effectiveness of note-taking can be found at: https://er.educause.edu/articles/2015/8/promoting-engagement-in-larger-classes. These study methods will also be discussed during the EAPS 10000 Planet Earth courses.


INTRODUCTION TO EARTH SCIENCE (p. 2-21)

Focus on Concepts: 1.1, 1.2, 1.3, 1.4, 1.5

Concepts and Principles: Key Terms:
The Earth Sciences Hypothesis
Earth as a System Theory
Scales of Space and Time
Resources and Environmental Issues
Scientific Inquiry, Scientific Method

Figures to Study: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13, 1.14, 1.15, 1.16, 1.17, 1.18, 1.19
Give It Some Thought: 1, 2, 3, 4, 5, 6, 8

UNIT 1 - EARTH MATERIALS

Chapter 1 – Matter and Minerals (p. 23-42)

Focus on Concepts: 1.1, 1.2, 1.3, 1.4, 1.5

Concepts and Principles: Key Terms:
Minerals Mineral
Isotopes and Radioactivity Radioactivity
Properties of Minerals Silicate
Bonds Silicon-Oxygen tetrahedron

Figures to Study: 1.1, 1.2, 1.3, 1.4, 1.8, 1.10, 1.11, 1.12, 1.13, 1.14, 1.15, 1.16, 1.17, 1.21, 1.22, 1.23, 1.24, 1.27, 1.30
Give It Some Thought: 1, 2, 3, 4, 5

Chapter 2 - Rocks: Materials of the Solid Earth (p. 44-75)

Focus on Concepts: 2.1, 2.2, 2.3, 2.4, 2.5

Concepts and Principles: Key Terms:
Rock cycle Magma
UNIT 2 – SCULPTURING EARTH'S SURFACE

Chapter 3 - Landscapes Fashioned by Water (p. 77-113)

Focus on Concepts: 3.1, 3.2, 3.3, 3.5, 3.6, 3.7, 3.8, 3.11, 3.18


Key Terms: Mass Wasting, Weathering, Erosion, Deposition, Deltas, Porosity, Aquifer

Give It Some Thought: 1, 2, 3, 4, 5

Chapter 4 - Glacial and Arid Landscapes (p. 115-141)

Focus on Concepts: 4.1, 4.2, 4.3, 4.5, 4.6, 4.9

Concepts and Principles: Glaciers, Glacial Deposits, Ice Ages, Deserts

Key Terms: Till, Moraine, Drift, Loess

Figures to Study: 4.2, 4.5, 4.10, 4.11, 4.13, 4.14, 4.17, 4.22, 4.24, 4.25, 4.35, 4.36
Give It Some Thought: 1, 2, 3

UNIT 3 – FORCES WITHIN

Chapter 5 - Plate Tectonics: A Scientific Revolution Unfolds (p. 143-171)

Focus on Concepts: 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9

Concepts and Principles: Plate Boundaries, Plate Tectonics, Seafloor Spreading, The Driving Mechanism

Key Terms: Continental Drift, Divergent, Convergent, Transform, Lithosphere, Asthenosphere
Chapter 6 - Restless Earth: Earthquakes, Geologic Structures, and Mountain Building (p. 173-209)

Focus on Concepts: 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.10, 6.12

Concepts and Principles:  
Elastic Rebound Theory  
Seismology  
P, S, Surface Waves  
Earth's Interior Structure  
Accretion

Key Terms:  
Earthquake  
Faults  
Magnitude  
Tsunamis  
Lithosphere  
Asthenosphere  
Crust, Mantle, Core  
Deformation

Figures to Study: 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 6.10, 6.11, 6.12, 6.13, 6.14, 6.15, 6.16, 6.17, 6.18, 6.19, 6.21, 6.24, 6.25, 6.26, 6.29, 6.30, 6.31, 6.32, 6.33, 6.34, 6.35, 6.39, 6.40, 6.41, 6.42, 6.44, 6.45, 6.46, 6.47, 6.48

Give it Some Thought: 1, 2, 3, 4, 5, 7, 10

Chapter 7 – Volcanoes and Other Igneous Activity (p. 211-247)

Focus on Concepts: 7.1, 7.2, 7.3, 7.4, 7.5, 7.7, 7.8, 7.12

Concepts and Principles:  
Volcanic Eruptions  
Volcano Types  
Volcanic Composition  
Volcanic Hazards

Key Terms:  
Viscosity  
Shield Volcanoes  
Composite Volcanoes  
Magma  
Caldera  
Pyroclastics

Figures to Study: 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8, 7.9, 7.10, 7.11, 7.12, 7.13, 7.14, 7.15, 7.16, 7.17, 7.18, 7.19, 7.20, 7.21, 7.22, 7.23, 7.24, 7.25, 7.27, 7.30, 7.32, 7.33, 7.34, 7.35, 7.36, 7.37

Give it Some Thought: 1, 2, 3, 4, 5, 7, 10

UNIT 4 - DECIPHERING EARTH'S HISTORY

Chapter 8 - Geologic Time (p. 249-271)

Focus on Concepts: 8.1, 8.2, 8.4, 8.5, 8.6
UNIT 5 - THE GLOBAL OCEAN

Chapter 9 - Oceans: The Last Frontier (p. 273-297)


Concepts and Principles:
Composition of Seawater
Ocean Bathymetry

Key Terms:
Continental Shelf
Continental Slope
Abyssal Plain
Mid-Ocean Ridge
Atolls

Give it Some Thought: 1, 2, 3, 4, 5

Chapter 10 - The Restless Ocean (p. 299-327)

Focus on Concepts: 10.1, 10.2, 10.3, 10.5, 10.7, 10.7, 10.8

Concepts and Principles:
Ocean Circulation, Currents
Shoreline Processes

Key Terms:
Coriolis Effect
Upwelling
Tides
Waves
Longshore Currents

Figures to Study: 10.1, 10.2, 10.4, 10.5, 10.7, 10.8, 10.9, 10.10, 10.11, 10.12, 10.13, 10.14, 10.15, 10.16, 10.18, 10.19, 10.20, 10.21, 10.22, 10.23, 10.24, 10.25, 10.26, 10.27, 10.28, 10.29, 10.30, 10.31, 10.32, 10.32
Give it Some Thought: 1, 2, 5, 7, 8, 9
UNIT 6 - THE ATMOSPHERE

Chapter 11 - Heating the Atmosphere (p. 329-359)

Focus on Concepts: 11.1, 11.2, 11.3, 11.4, 11.5, 11.6, 11.7, 11.9, 11.10

Concepts and Principles:
Composition of the Atmosphere
Structure of the Atmosphere
Cause of Seasons
Electromagnetic Radiation
Greenhouse Effect
Global Warming

Key Terms:
Weather
Climate
Rotation
Revolution
Radiation
Conduction
Convection


Give it Some Thought: 1, 2, 3, 4, 5, 7, 9

Chapter 12 – Moisture, Clouds, and Precipitation (p. 361-393)

Focus on Concepts: 12.2, 12.3, 12.4

Concepts and Principles:
Precipitation
Condensation
Evaporation
Adiabatic Cooling

Key Terms:
Latent Heat
Humidity

Figures to Study: 12.2, 12.8, 12.11, 12.12, 12.13, 12.15, 12.26, 12.35

Give it Some Thought: 1, 7

Chapter 13 - The Atmosphere in Motion (p. 395-414)


Concepts and Principles:
Atmospheric Circulation
High and Low Pressure Systems

Key Terms:
Air Pressure
Wind
Gradient
Coriolis Effect


Give it Some Thought: 1, 3, 5, 6, 7, 8, 9

Chapter 14 - Weather Patterns and Severe Weather (p. 417-443)

Focus on Concepts: 14.2, 14.4, 14.5, 14.6
UNIT 7 - EARTH'S PLACE IN THE UNIVERSE

Chapter 15 - The Nature of the Solar System (p. 445-481)

Focus on Concepts: 15.1, 15.2, 15.3, 15.4, 15.5, 15.6, 15.7

Concepts and Principles:
Air Masses
Fronts
Tornadoes
Hurricanes

Key Terms:
Thunderstorm
Saffir-Simpson Scale

Give it Some Thought: 2, 4, 5, 6, 7, 8, 9, 10

Chapter 16 - Beyond the Solar System (p. 483-509 [including Appendix C])

Focus on Concepts: 16.1, 16.3, 16.4, 16.5, 16.6, 16.7

Concepts and Principles:
Planets
Origin of the Solar System
Earth's Moon

Key Terms:
Asteroids
Impact Craters
Astronomical Units
Terrestrial Planets

Figures to Study: 15.2, 15.3, 15.4, 15.9, 15.11, 15.13, 15.16, 15.17, 15.18, 15.19, 15.20, 15.21, 15.22, 15.23, 15.27, 15.28, 15.29, 15.31, 15.32, 15.33, 15.34, 15.35, 15.37, 15.39, 15.40, 15.42, 15.45, 15.46, 15.47, 15.48
Give it Some Thought: 1, 2, 5, 6

Concepts and Principles:
Measuring Distances
Hertzsprung-Russell Diagram
Stellar Evolution
Galaxies
Big Bang Theory
Cosmology

Key Terms:
Stellar Parallax
Light-Year
Apparent Magnitude
Absolute Magnitude
Red Shift
Doppler Effect
Hubble's Law

Give it Some Thought: 2, 3, 5, 6