Geology 104: Earth Science

Spring 2025 (1 section)

3 February through 2 June
(16 weeks)

Miramar
San Diego Miramar College

Revised 27 January 2025

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"Mostly" retired Geology professor…

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https://geology104online.geology-guy.com

https://sdccd.instructure.com (Canvas)

Phone/text: (don't like it – please use E-mail)

Course Syllabus:

The latest is always on the "unofficial" web site, and in Canvas

Office Hours:

"Office" Hours: Monday evenings, 6-7 PM, (or by request) using Zoom… ***(send me an email – if I'm not busy, I'd be glad to help, any time!)***

Teaching Philosophy

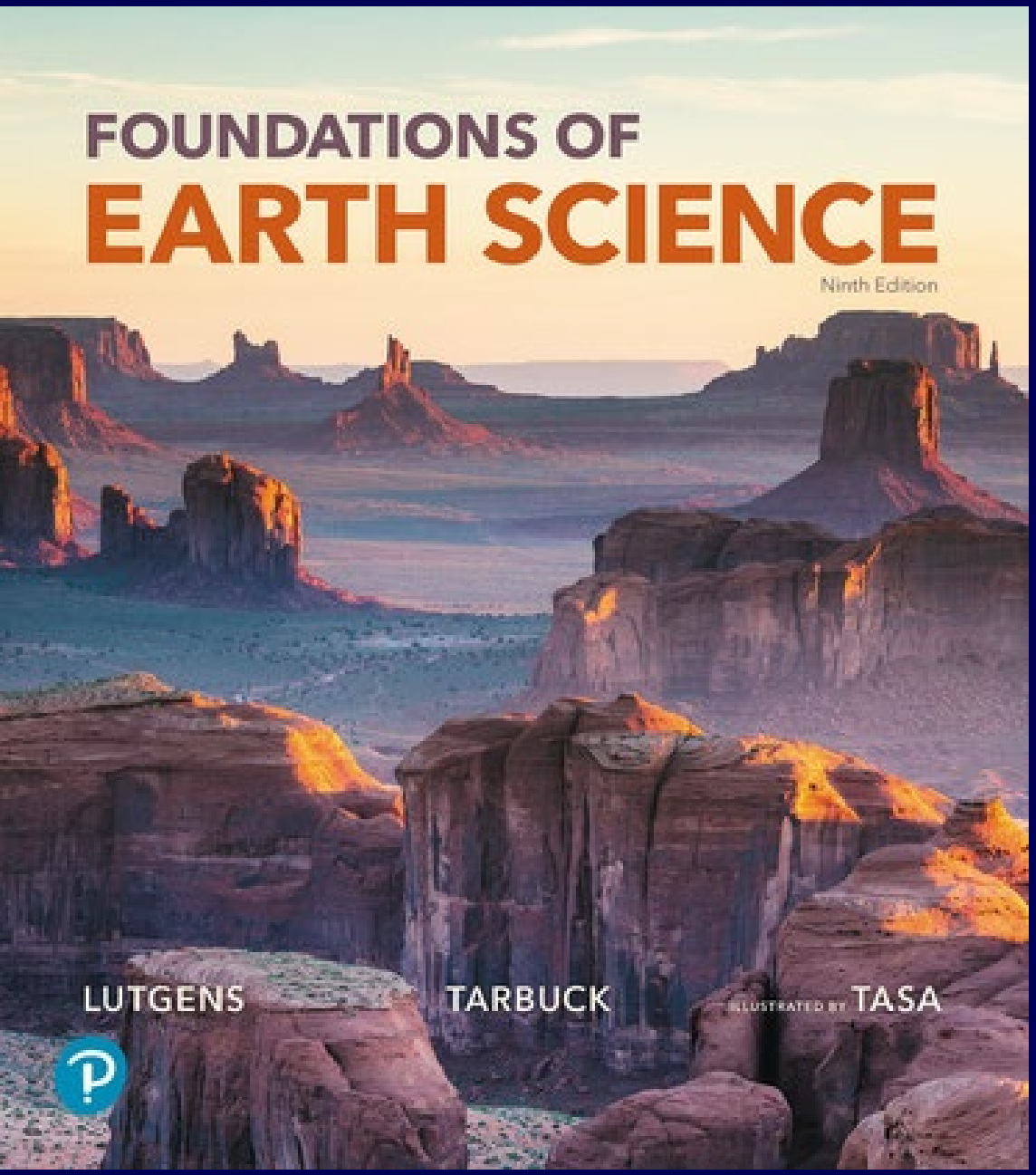
I don't consider myself a ***teacher***. I can't ***teach*** you anything. My goal is to encourage you to ***learn***. Think of me as a cheerleader…

I don't ***give*** grades. I just ***keep score***. ***You*** are responsible for your success.

Note that geology is a highly ***interdisciplinary*** field of study.

Lesson 1:

Earth - it's all one thing!



Required **E-text book:**

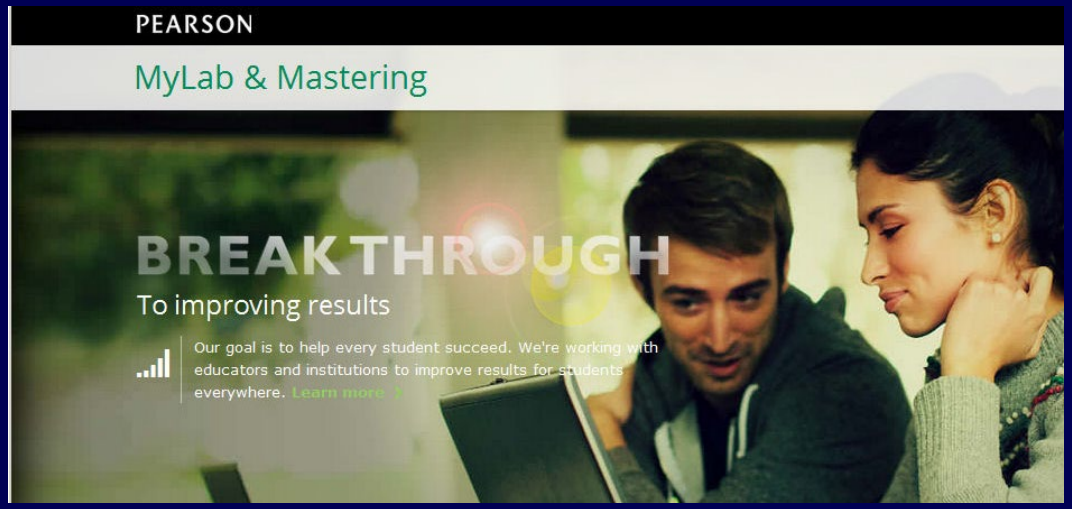
"Foundations of Earth Science"
(9th edition)

by Lutgens, Tarbuck & Tasa

available in Miramar College Bookstore, cost: $58.82

(7th or 8th editions of paper text OK)

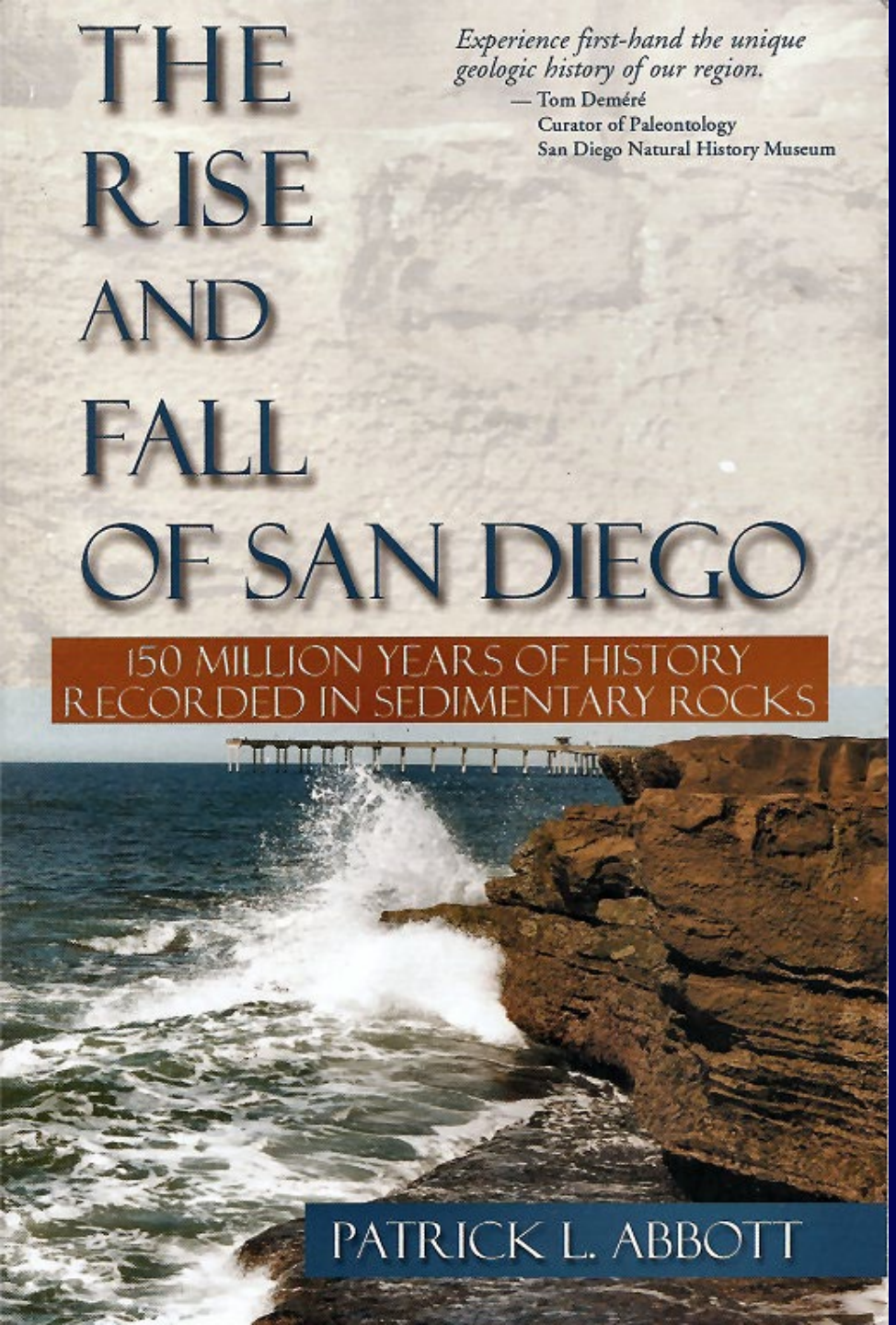
Required Canvas Plug-in:



"Modified Mastering Geology"

Only **available in Miramar College Bookstore included in cost of e-text for $58.82 (NOT through Canvas)**

See instructions (including PowerPoints/Videos/PDF's) for more info



Optional Book:

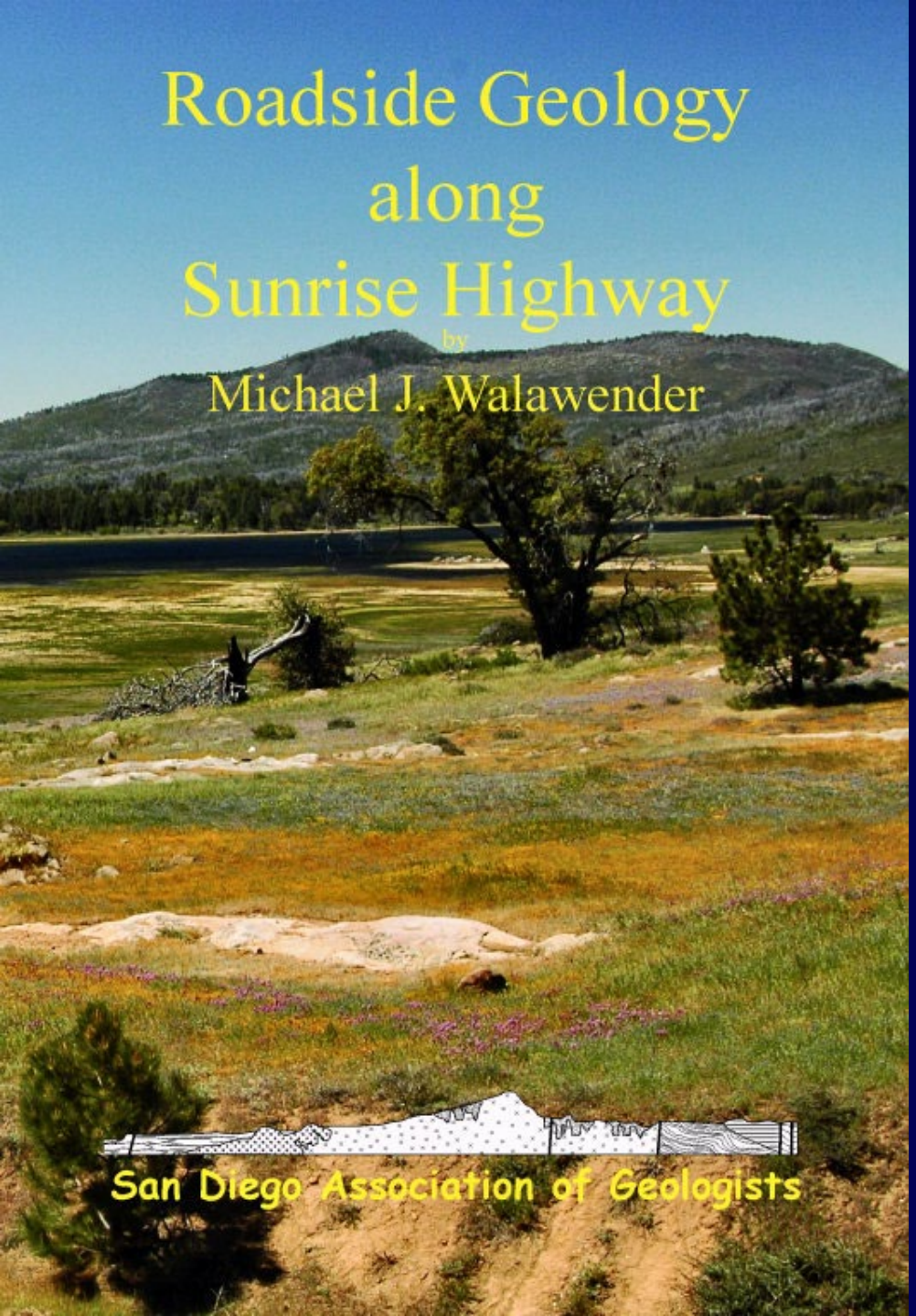
("nice to have")

"Rise and Fall"

by Pat Abbott

available in finer bookstores everywhere, Online

Sedimentary Rocks along San Diego Coast



Optional Book:

("nice to have")

"Roadside Geology Along Sunrise Highway"

by Mike Walawender

Igneous & Metamorphic rocks in S.D. back country


Unlikely Field Trips:
Tourmaline Beach, among others

Student Learning Outcomes "SLO's"

- Students will be able to:
  - summarize the defining characteristics of a mineral; differentiate among igneous, sedimentary, and metamorphic rocks in terms of the rock cycle.

What Will I Learn?

- what Earth Science is and what such scientists do.
- an appreciation of the immensity of geologic time
  - punctuated by instantaneous catastrophic events such as earthquakes, tsunamis, floods, landslides and volcanic eruptions (plus rocks from outer space)
- an understanding of how a variety of minerals and rocks are produced in the earth's crust.
- the geologic origins of important mineral resources and the distribution of these resources on the earth.
- an appreciation of how much we have learned about Earth processes since I began my geological studies fifty-nine (59!!!) years ago.
- In addition to physical geology, we'll cover Oceanography, Meteorology (weather), Climatology (climate), & Astronomy (mainly Solar System)

What Will I Learn? (continued)

- Mountain-building and opening of ocean basins
- Bizarre sea creatures that live at underwater volcanic vents
- Waves and coastal hazards
- Earthquakes in some surprising places…
- Supervolcanoes capable of rapid climate change
- How to use Internet resources to keep up to date on Earth changes
- Global climate changes through time
- … and more!

SoCal Regional Geology

- One of the best places in the nation to study Geology
  - San Andreas Fault ZONE
- Living laboratories:
  - Rose Canyon fault (and others)
    - Mission Bay, S.D. Bay, Mount Soledad
  - Santiago Peak volcanics
  - Marine sediments exposed in sea cliffs
  - Peninsular Ranges Batholith
  - Anza Borrego Desert State Park
  - Salton Buttes
    - Live volcanoes at our doorstep!

Syllabus Summary

- PowerPoint presentations are only outlines
- You paid big bucks for the book – use it!
  - End-of-chapter materials are useful (summaries, review questions, key terms)
  - Within chapters, additional items are added:
    - End of chapter:
      - "Concepts in Review"
      - "Give it some thought"
    - "Eye on Earth" boxes
    - "Concept Check" boxes
    - Graphics/videos in general – visualization is fundamental

Online: benefits vs. drawbacks

- Big benefit: freedom!

- BUT…
  - You are your own boss…
  - Self-discipline required
  - Attention to details
  - Keeping up with the schedule
  - Reading comprehension
  - Writing skills

Canvas (Blackboard replacement)

This will be my tenth or so class using this new software. Be patient with the OLD man (born in 1945, do the math…)

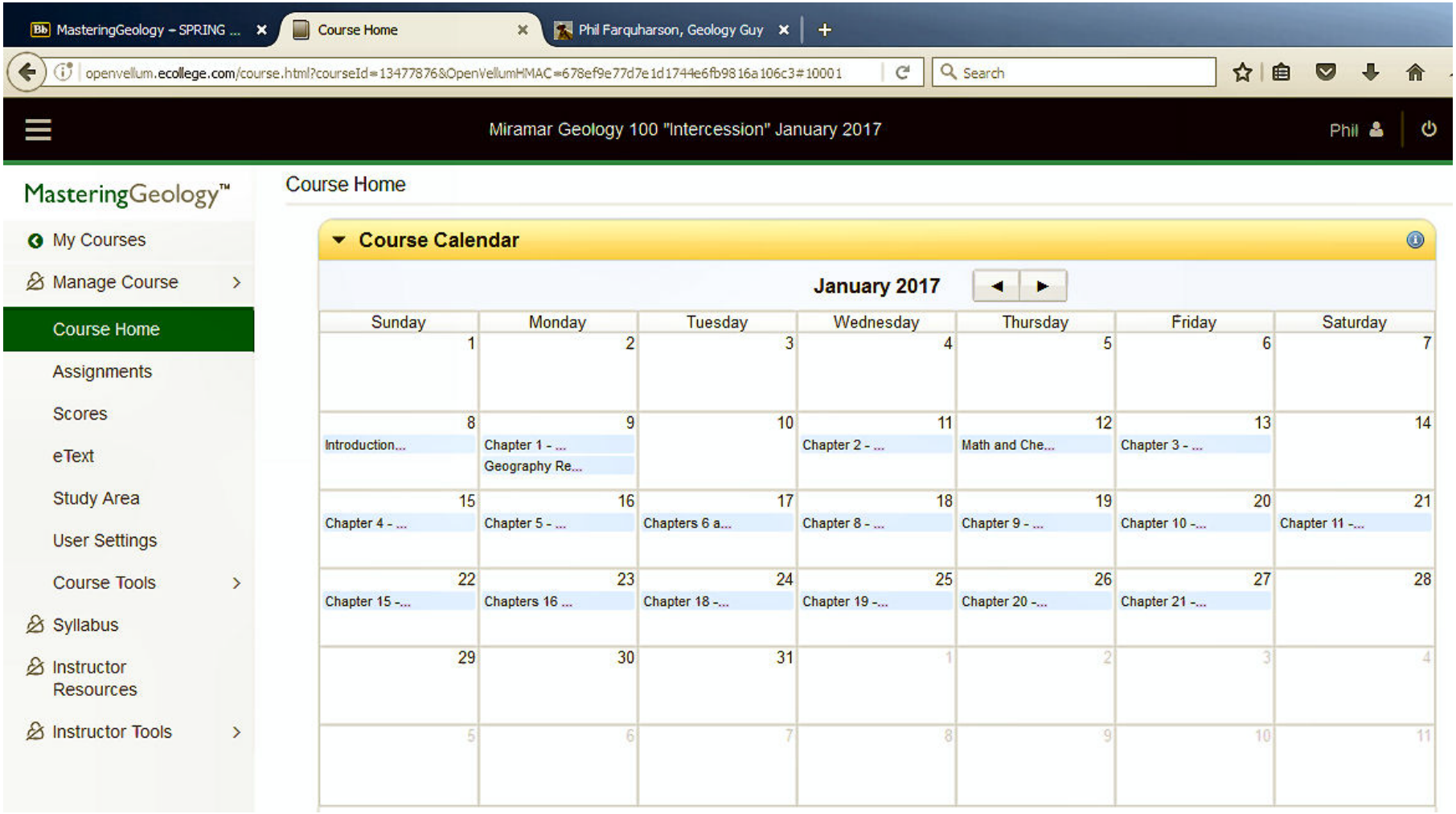
I used to be a software engineer. My mantra was “if it ain’t intuitive, it’s broke!”…

Also I’m a guy. General philosophy: if it’s good software, it shouldn’t need any stinkin’ instructions!
</rant>

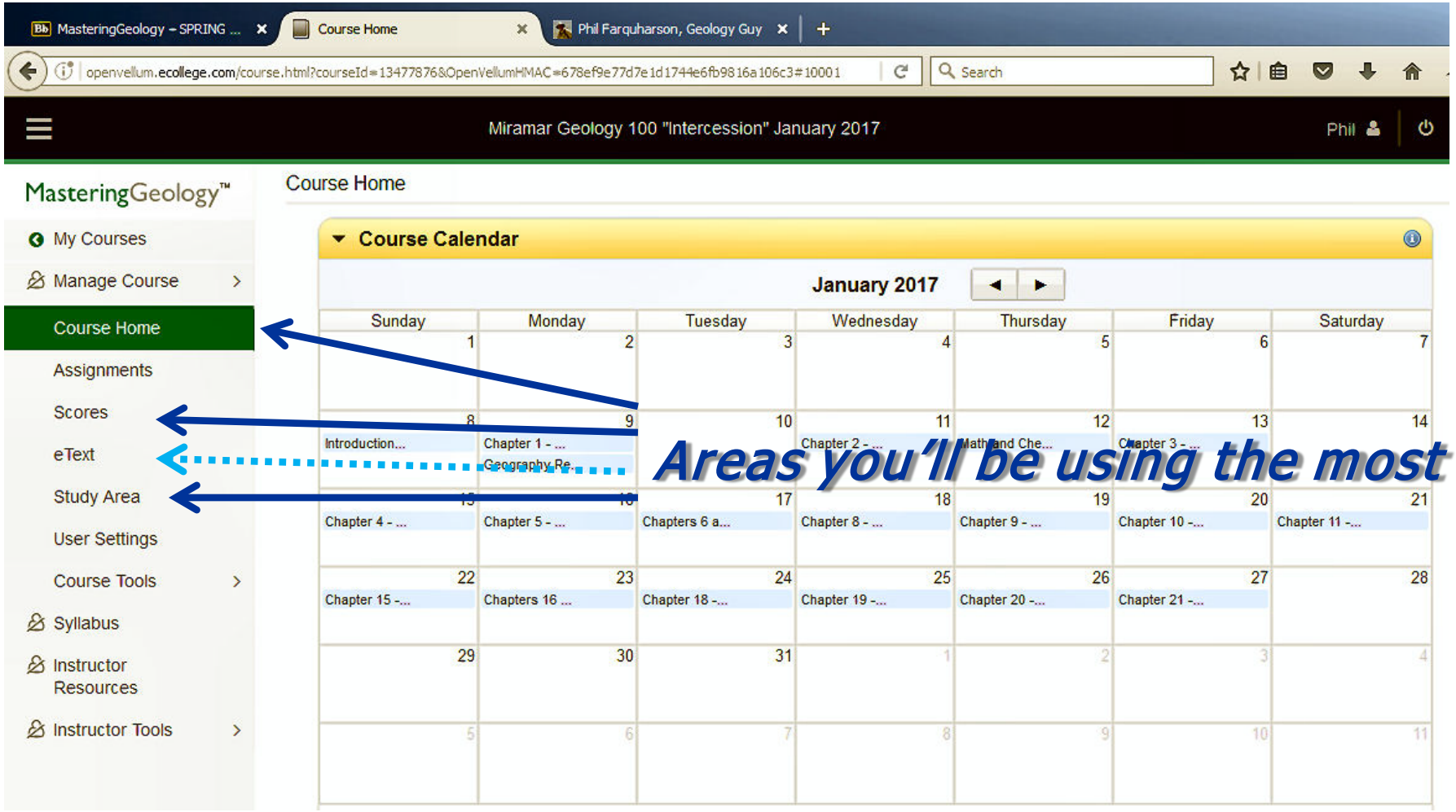
Canvas seems to be better than Blackboard was – I got to really wring it out during the start of COVID-19!

MasteringGeology Home

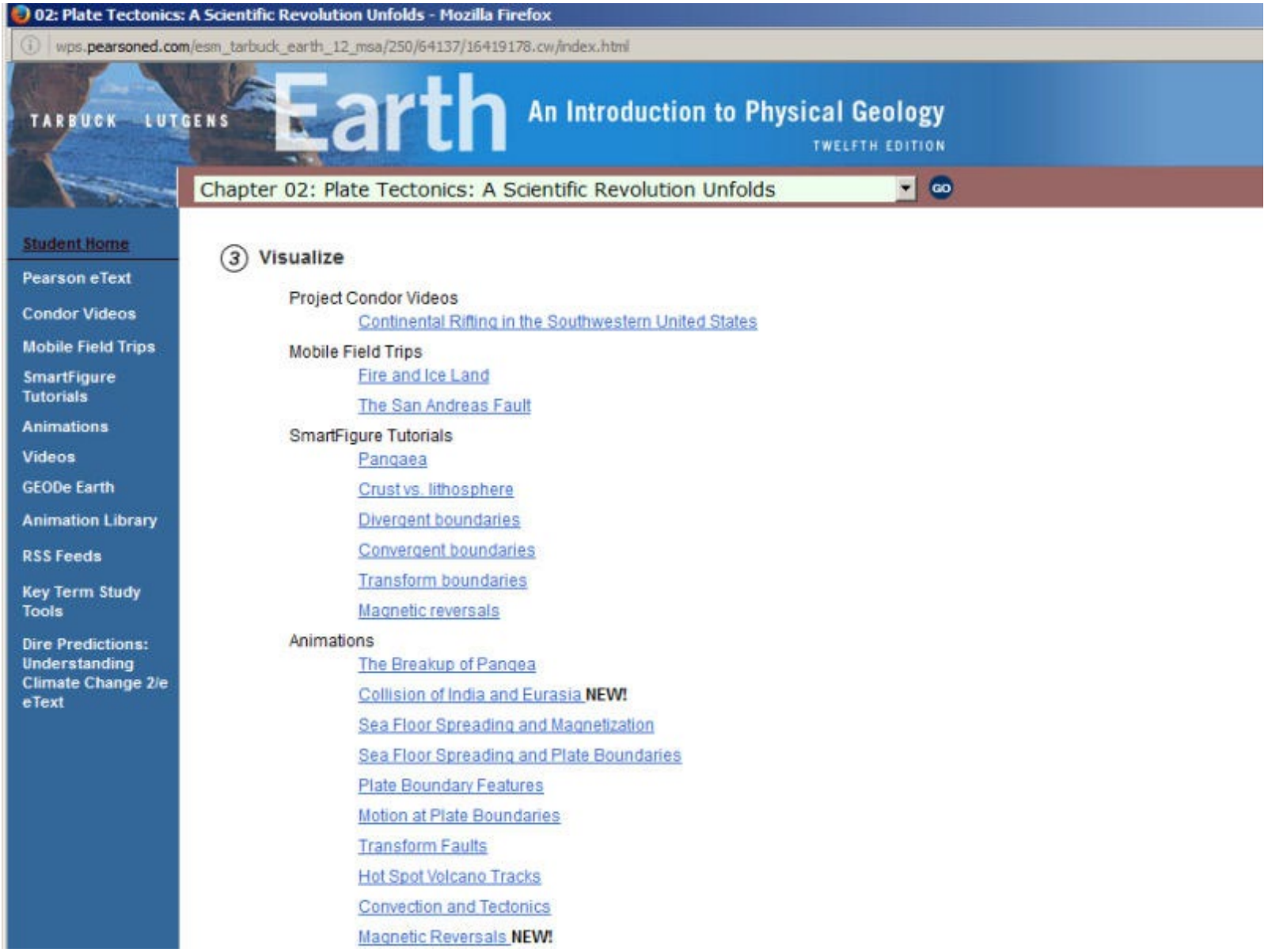
(accessed through Canvas → MyLab and Mastering)



MasteringGeology Home



MasteringGeology Study Area



Focus On Concepts

TARBUCK LUTGENS **Earth** An Introduction to Physical Geology TWELFTH EDITION

Chapter 02: Plate Tectonics: A Scientific Revolution Unfolds GO

Student Home
Pearson eText
Condor Videos
Mobile Field Trips
SmartFigure Tutorials
Animations
Videos
GEODe Earth
Animation Library
RSS Feeds
Key Term Study Tools
Dire Predictions: Understanding Climate Change 2/e eText

- Discuss the view that most geologists held prior to the 1960s regarding the geographic positions of the ocean basins and continents.
- List and explain the evidence presented by Wegener to support his continental drift hypothesis.
- Discuss the two main objections to the continental drift hypothesis.
- Identify Earth's major plates on a map and list and describe the three types of plate boundaries.
- Sketch and describe the movement along a divergent plate boundary that results in the formation of new oceanic lithosphere.
- Compare and contrast the three types of convergent plate boundaries and name a location where each type can be found.
- Describe the relative motion along a transform fault boundary and be able to locate several examples on a plate boundary map.
- Summarize the evidence used to support the plate tectonics theory.
- Describe two methods researchers use to measure relative plate motion.
- Discuss what is meant by plate–mantle convection and explain two of the primary driving forces for plate motion.

Visualize:

Chapter 02: Plate Tectonics: A Scientific Revolution Unfolds GO

- Student Home
- Pearson eText
- Condor Videos
- Mobile Field Trips
- SmartFigure Tutorials
- Animations
- Videos
- GEODe Earth
- Animation Library
- RSS Feeds
- Key Term Study Tools
- Dire Predictions: Understanding Climate Change 2/e eText

③ Visualize

Project Condor Videos
- Continental Rifting in the Southwestern United States

Mobile Field Trips
- Fire and Ice Land
- The San Andreas Fault

SmartFigure Tutorials
- Pangaea
- Crust vs. lithosphere
- Divergent boundaries
- Convergent boundaries
- Transform boundaries
- Magnetic reversals

Animations
- The Breakup of Pangea
- Collision of India and Eurasia **NEW!**
- Sea Floor Spreading and Magnetization
- Sea Floor Spreading and Plate Boundaries
- Plate Boundary Features
- Motion at Plate Boundaries
- Transform Faults
- Hot Spot Volcano Tracks
- Convection and Tectonics
- Magnetic Reversals **NEW!**

Read (e-text – if you opt in…)

Animations

GEODe

RSS Feed

Key Term Study Tools

② Read

Chapter 01: An Introduction to Geology

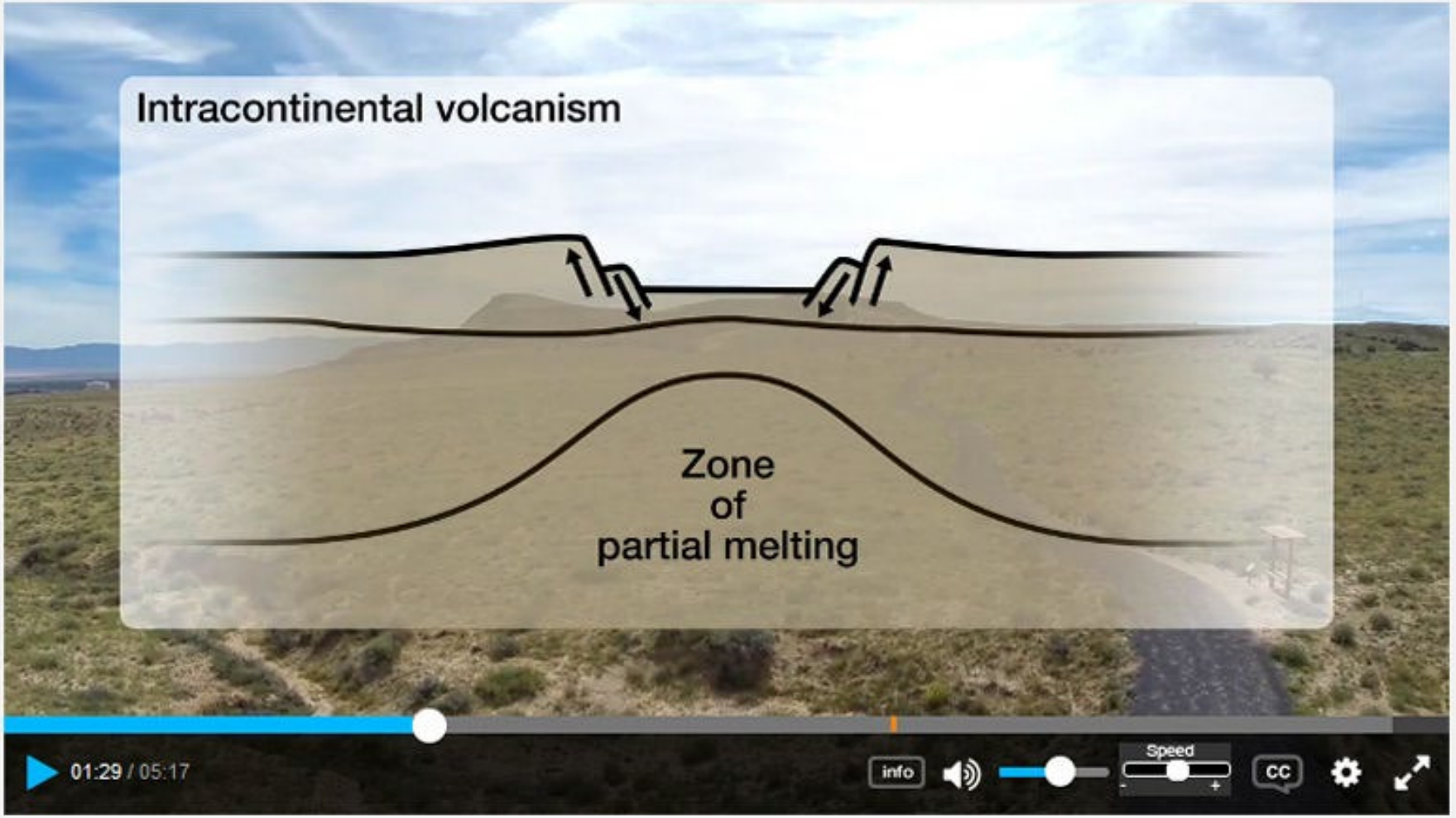
③ Visualize

SmartFigures

- Geologic Time
- The Nebular Theory
- Earth's Layers
- The Rock Cycle
- Shields, platforms, and mountain belts

GEODe Earth

Visualize: Project Condor Videos



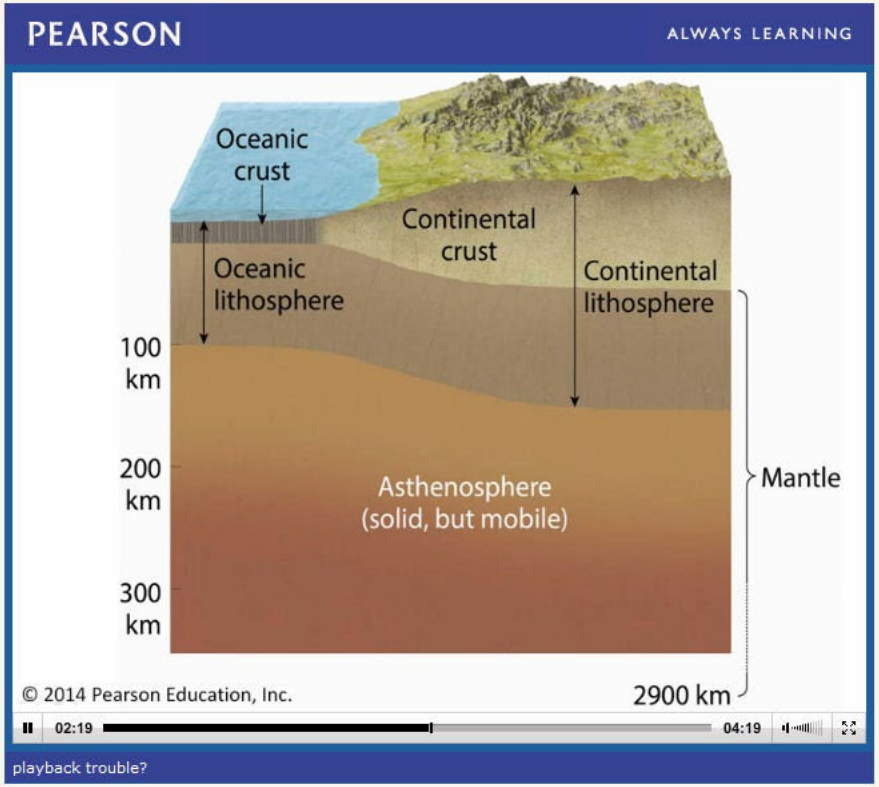
Mobile Field Trips

Visualize: "SmartFigures"

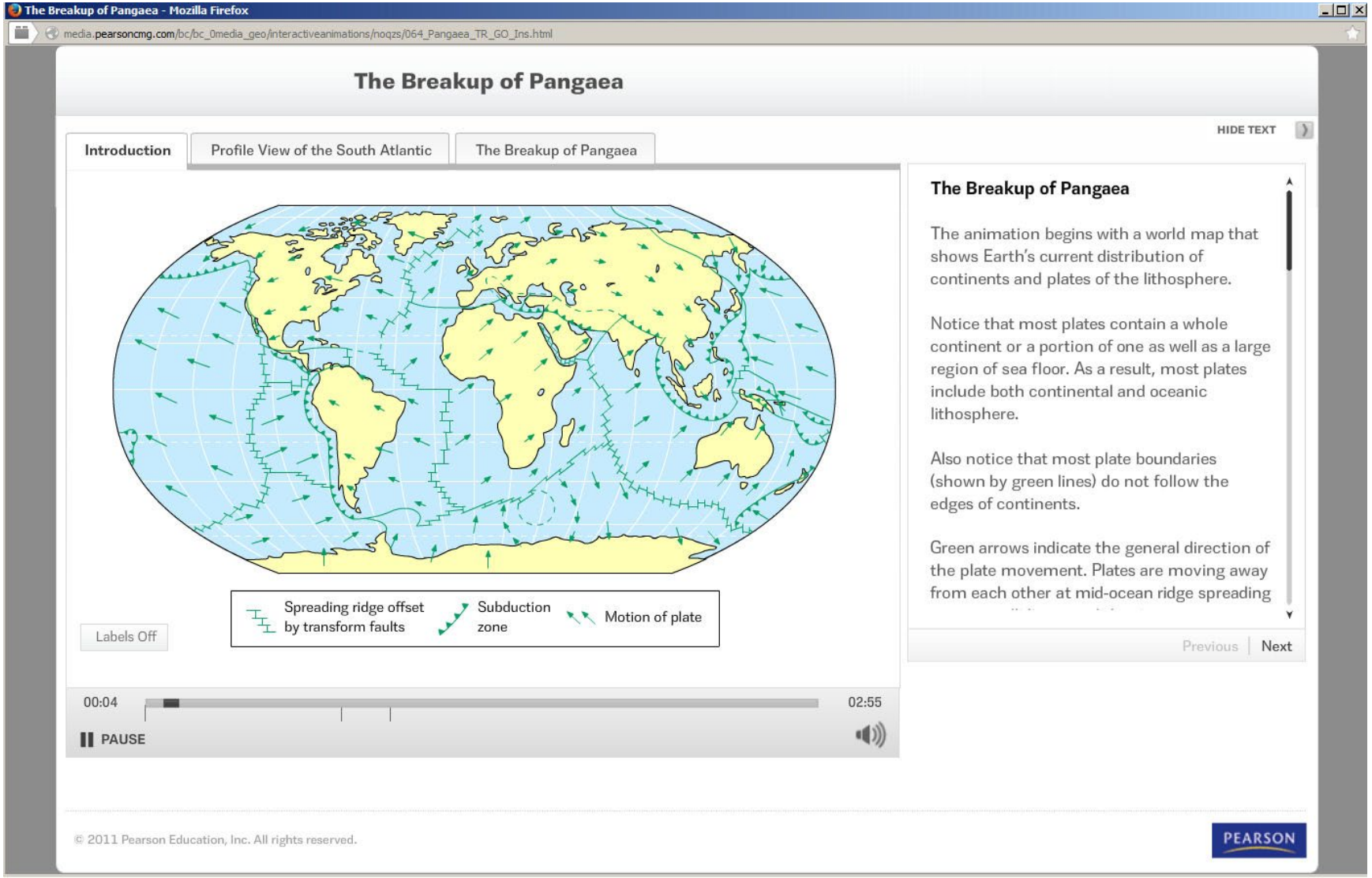
Pearson Science - Smart Figures - Mozilla Firefox

media.pearsoncmg.com/bc/bc_0media_geo/smartfigure/sf-CrustVsLithosphere.html

SmartFigures are posted for the exclusive use of students and instructors using the 11th Edition of Earth: An Introduction to Physical Geology, by Tarbuck, Lutgens, and Tasa, and the 7th Edition of Foundations of Earth Science, by Lutgens, Tarbuck, and Tasa. All art Copyright 2014 Dennis Tasa.



Visualize: Animations



Chapter Quizzes (practice only)

Chapter 01: An Introduction to Geology GO

Home > Chapter 01: An Introduction to Geology > Student Home > Chapter Quiz

This activity contains 20 questions.

1. [Hint]

Which of the following are accurate definitions of *physical geology* and *historical geology*?

- Physical geology examines the materials composing Earth and seeks to understand the many processes that operate beneath and upon its surface. Historical geology documents the major discoveries, scientists, and development of geologic thought.
- Physical geology examines only the physics of Earth materials. Historical geology seeks to understand the origin of Earth and its development through time.
- Physical geology examines the materials composing Earth and seeks to understand the many processes that operate beneath and upon its surface. Historical geology examines the geologic period that covers human history.
- Physical geology examines the materials composing Earth and seeks to understand the many processes that operate beneath and upon its surface. Historical geology seeks to understand the origin of Earth and its development through time.

2. [Hint]

According to the textbook, understanding Earth is challenging because our planet is a [ ] body with many interacting parts and a complex history

3. [Hint]

A natural hazard is a natural process that endangers humans.

- True

Summary

- Keep up to date!
  - check ‘Announcements’ section in Canvas
- Canvas and the unofficial web site have links to other resources
  - Videos
  - PowerPoints
  - Web-links
  - And more!
- Be curious!

Summary

- Most of the learning will occur in MasteringGeology
  - For each chapter, there will be a:
    - **Homework** assignment (~15 to 45 points)
  - Use the Study Area for more information
- Things that will be submitted into Canvas:
  - Writing Assignments (400 points)
  - Rocks and minerals SLO exercise,
  - SLO Test (end of semester, 10 points)

Geology 100 Grades

Weighted Percentage

A (superior effort):	90 – 100%
B (better than average):	80 – 89%
C (average):	68 – 79%
D (below average):	55 – 67%
F (failing):	< 54%

Tentative Grades

Mastering homework:	**779 points**
Writing assignments (3):	**400**
Syllabus Quiz:	**10**
SLO (minerals/rocks) Quiz:	**10**

Total: 1,199 points

On a negative note…

- PLAGIARISM
  - Ugly word, even uglier deed!
  - Look it up – it's stealing…
  - It's easy to copy and paste from various sources, which makes it easy to detect!
  - "cheaters never prosper"
- 'nuff said…

If you don't understand, please ask!

(in a timely fashion)

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(***best*** way to contact me)

philfarq@gmail.com

(if you have questions)

the end?