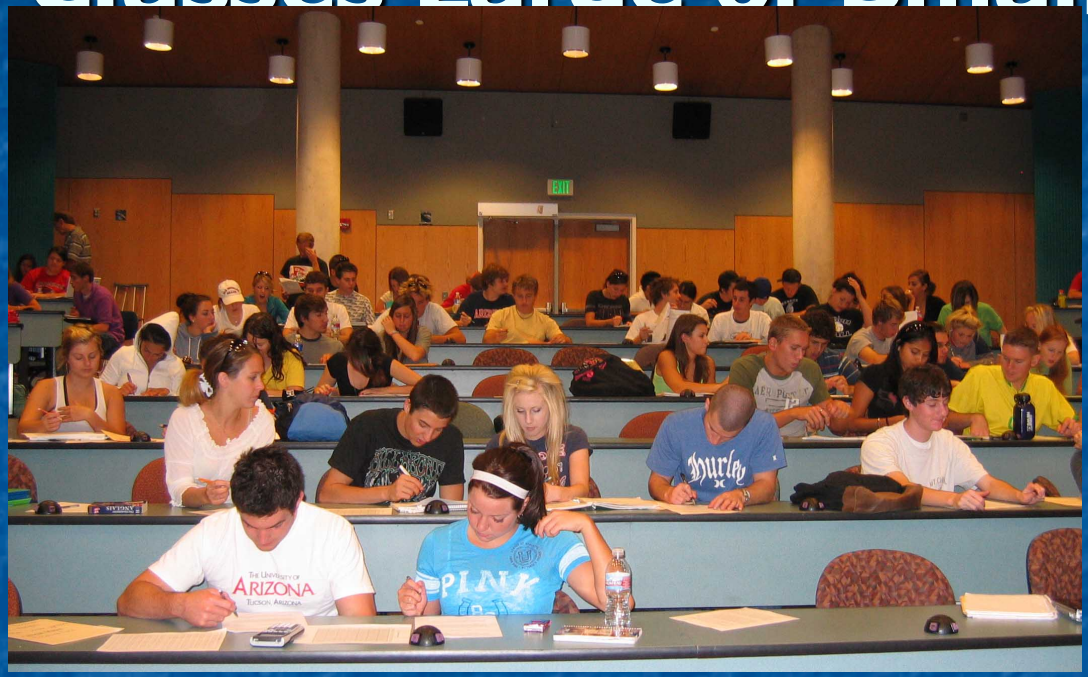
Engaging Students in Introductory Classes Large or Small



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College of William and Mary

Outline

I. "The Seasons" – a Think-Pair-Share Example
II. "The Wave" – an in-class activity
III. "Class Magma Chamber" – an in-class activity
IV. Reflect on Engaging Students

In-Class Write - Seasons: Part I

"What Accounts for Seasons on the Earth?"

Answer this question in 2-3 well written sentences, and use a diagram if you think it helps.

Use only 1/3 of your page, and put a line underneath your answer when done.

As always, use a full size piece of paper and put your name and section number on the quiz.

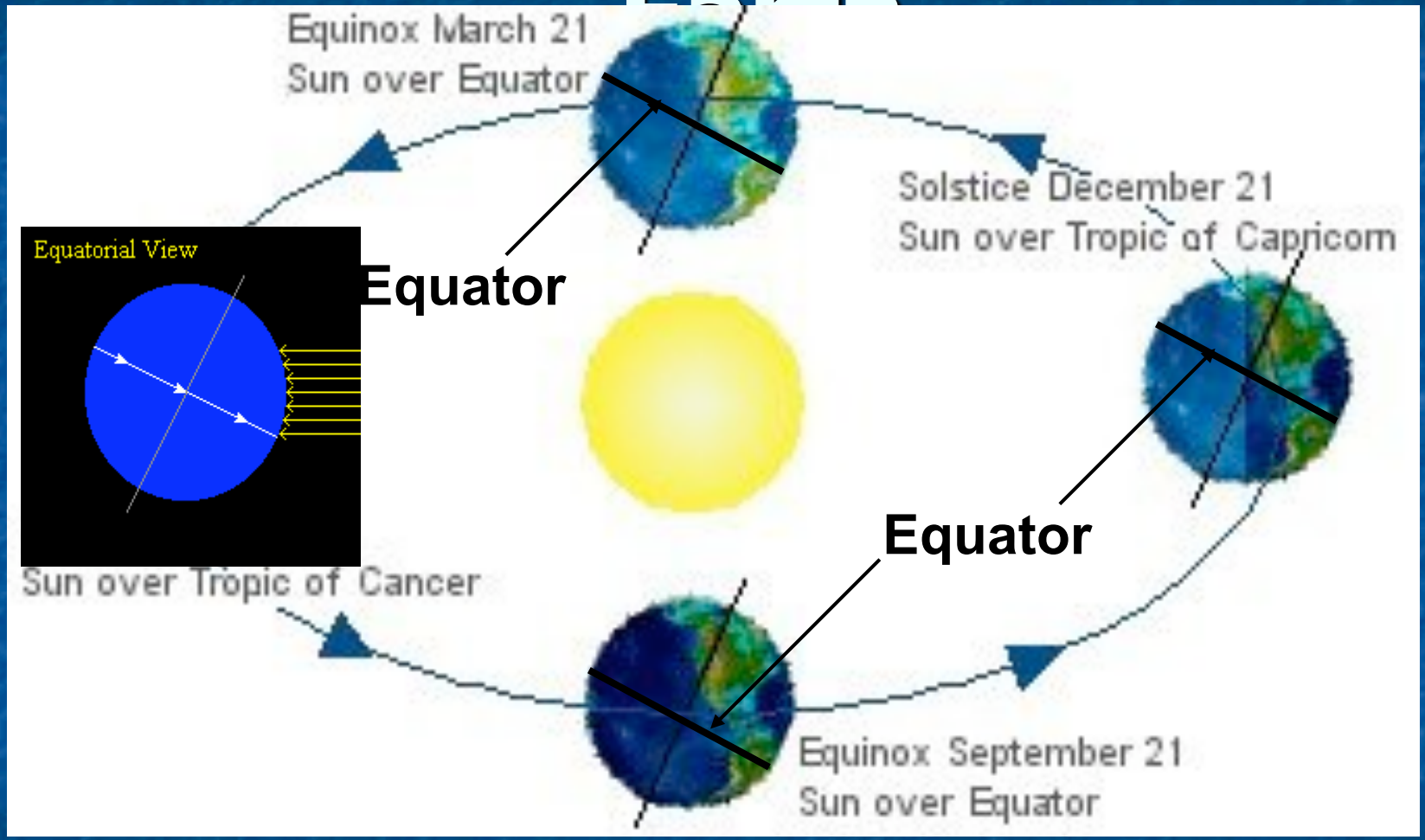
In-Class Write - Seasons: Part II

"What Accounts for Seasons on the Earth?"

Leave your first answer alone. Now, a piece of information: the distance of the Earth from the Sun has nothing to do with seasons.

You may talk with your neighbors. Then, on the second 1/3 of the page, answer the question in 2-3 sentences, with a diagram as appropriate.

Seasons: Due to Tilt of Earth



http://www.astronomy.ohio.state.edu/~pogge/Ast161/Unit2/seasons.html

In-Class Write - Seasons: Part III

"What Accounts for Seasons on the Earth?"

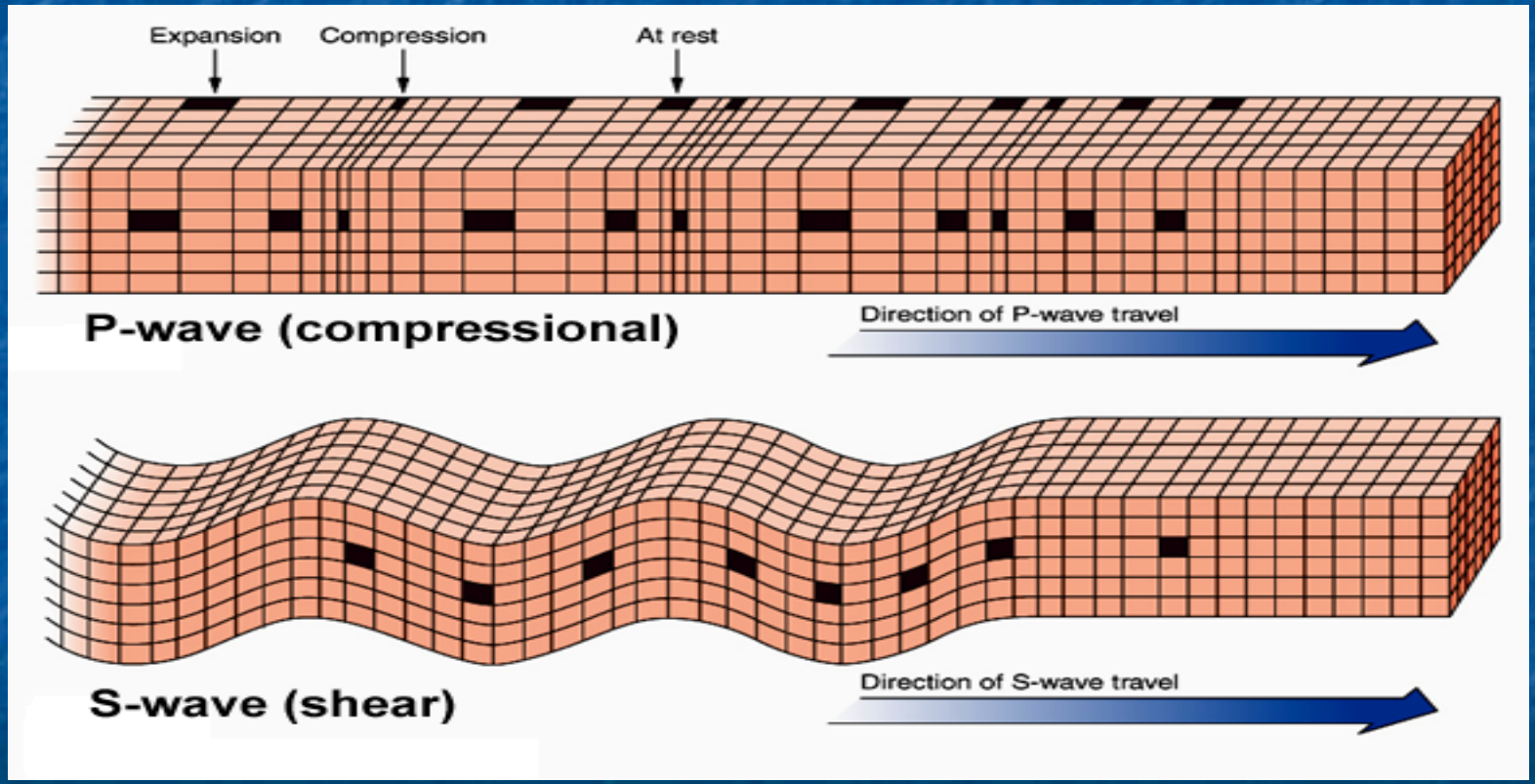
Leave your first two answers alone.

On the bottom 1/3 of the page, answer the question in 2-3 sentences, with a diagram as appropriate.

Body waves: can travel in Earth's interior

P waves: Pressure waves, can travel in fluid.

S waves: Shear waves, cannot travel in fluid.



And Blah Blah Blah ...

The Wave: In-class Activity

Please form a circle in the room (I've done this with 150 students at a time)

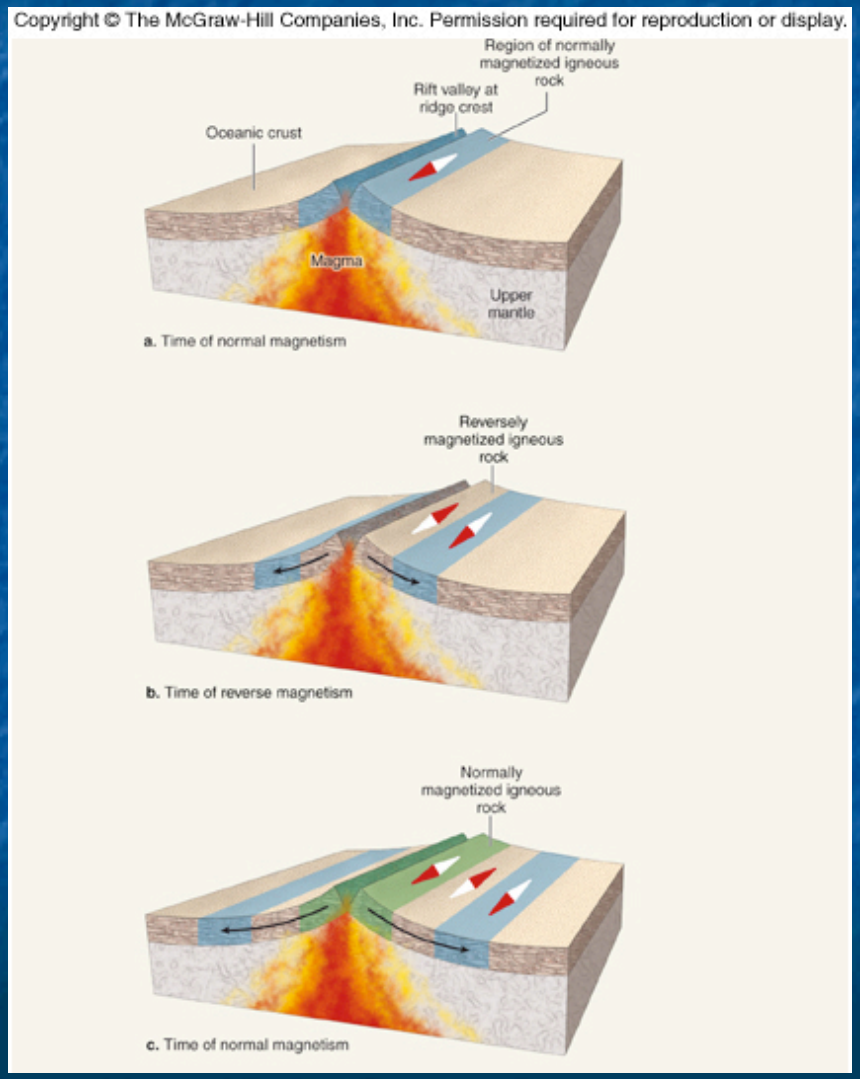
I'll ask someone to start 'The Wave' …

- How fast was the wave traveling?
- Let's make it go twice as fast!

What can students learn from this activity?

- Particle motion versus direction of wave motion
- Reflection and transmission of waves
- P vs S waves: travel through a fluid
- Speed = Wavelength / Period

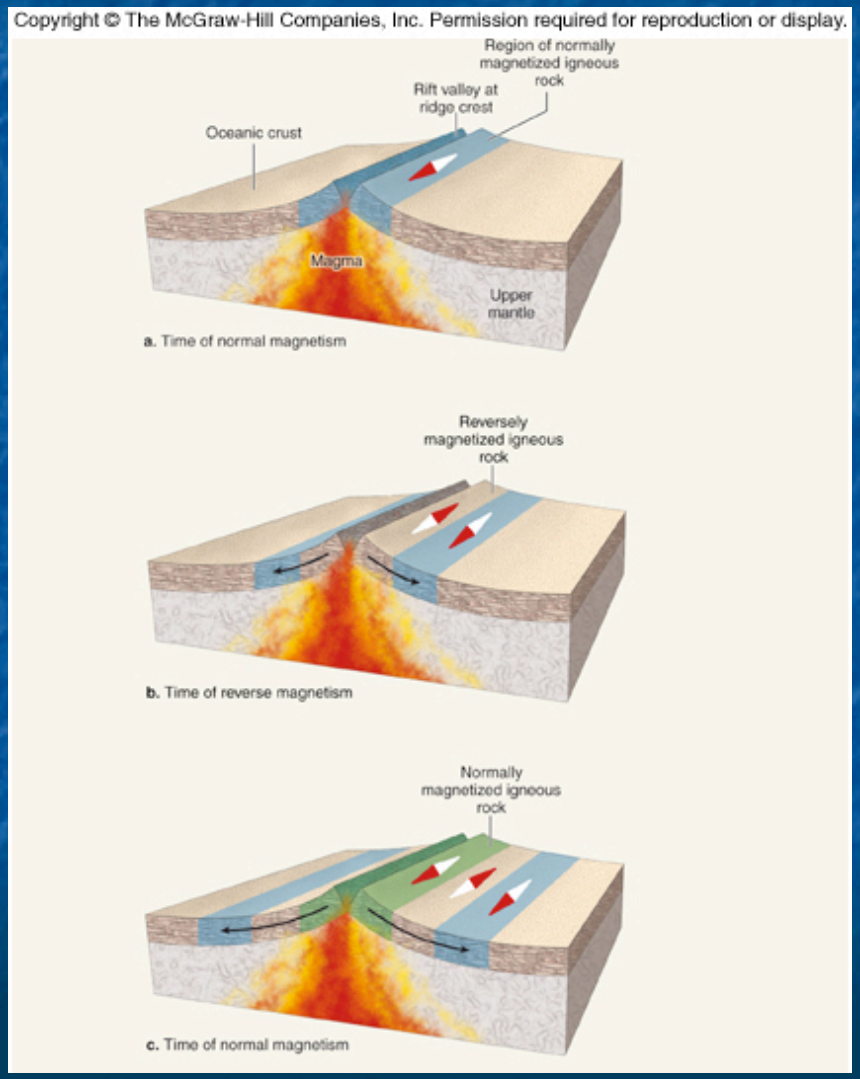
Formation of Ocean Lithosphere



As oceanic plates spread apart, magma rises to the surface and cools to become solid rock/lithosphere. As it cools, it 'freezes in' the polarity of the Earth's magnetic field at the time.

And blah blah blah.

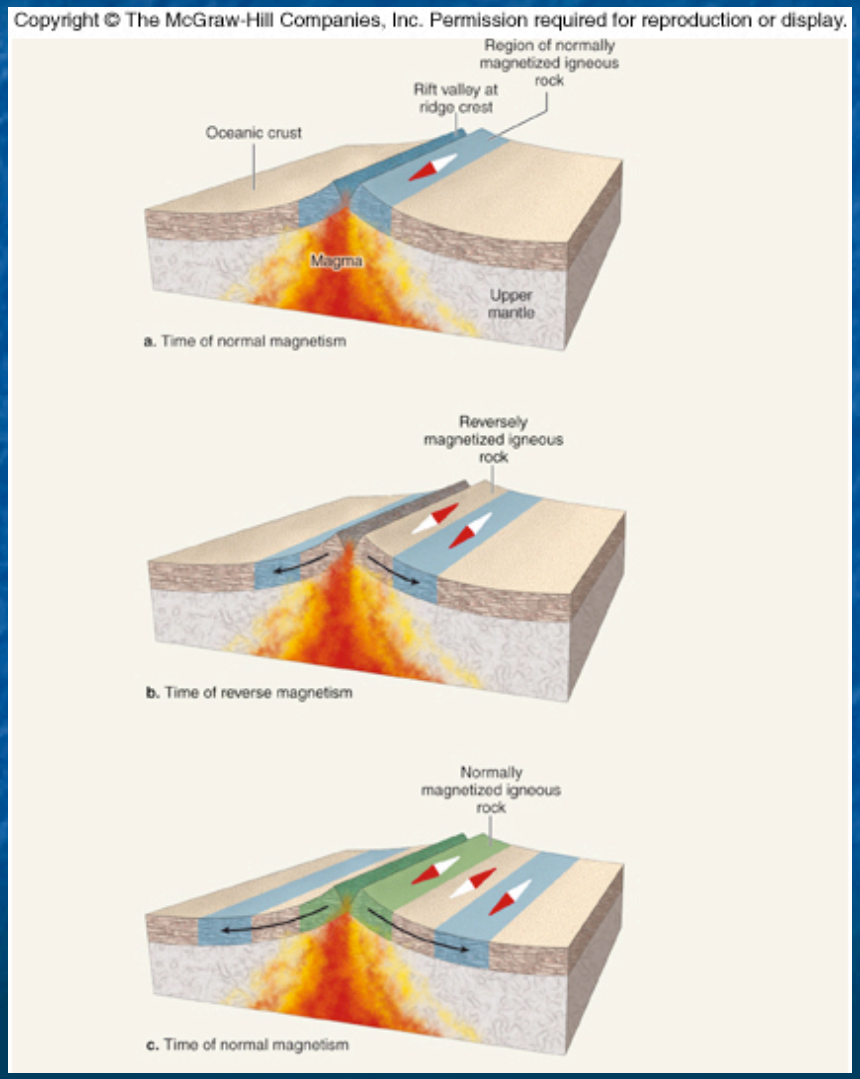
Class Magma Chamber ...



Please come to the front of the class and be a magma chamber below a continental rift.

Two of you will be the continent. Please take one step sideways and let out some magma (two students). These students face forward, reflecting today's polarity.

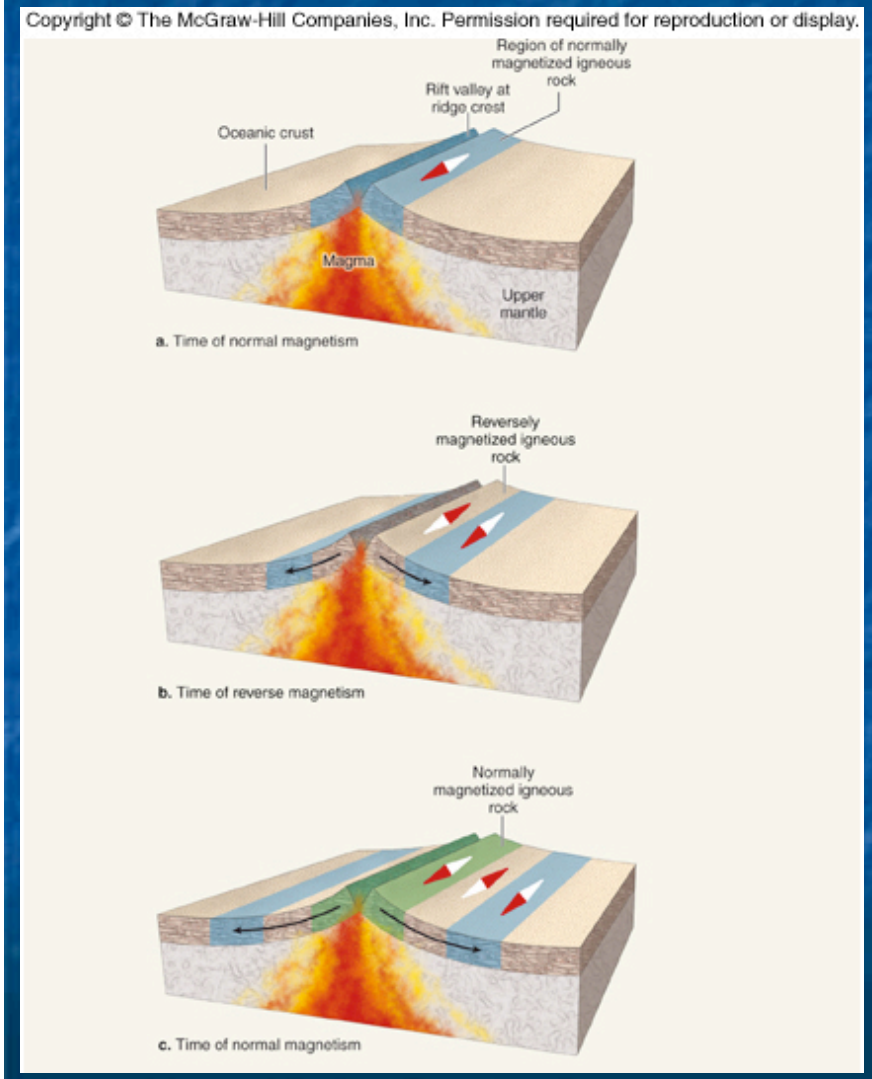
Class Magma Chamber ...



Take another step sideways and let out more magma, which now faces backwards because the polarity has changed.

Let's continue ...

Class Magma Chamber ...



What kinds of questions are easier for students to answer after this activity?

- **Where is the oldest oceanic lithosphere?**
- **Where is the youngest?**
- **Why don't the stripes keep changing each time polarity does?**

Now:

With a partner, think about the examples we have done so far, any others you may use or already know about, and answer …

"What do you think are benefits of efforts to engage students in Introductory Courses?"

Now:

With a different partner, think and answer …

"What do think some of the problems/challenges might be with efforts such as these to engage students?"

Finally:

The literature is clear: students learn more when they are actively engaged in their learning.

Look at some of the supporting materials I have provided and visit:

http://serc.carleton.edu/introgeo/interactive/index.html
(or http://serc.carleton.edu/ in general)