Geosphere Starter Sheet 1/24/18 or 1/25/18

Predict how the **surface** of the earth would change if two tectonic plates moved away from each other.

Vocabulary!

Definition

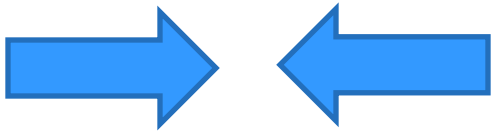
Where two plates collide with each other

Word: Convergent Boundary

Examples:

Nazca Plate + South American Plate = ANDES MOUNTAINS

Doodle:



Vocabulary!

Definition

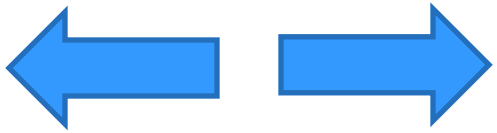
Where two plates move away from each other

Word: Divergent Boundary

Examples:

Mid-Atlantic Ridge

Doodle:



Vocabulary!

Definition

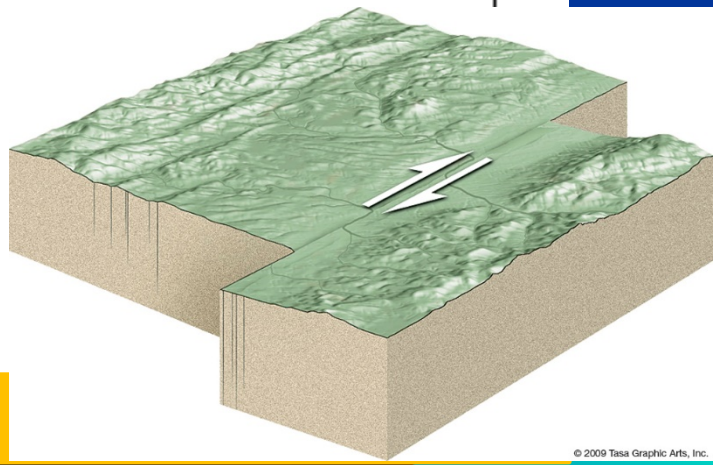
Where two plates move parallel to each other

Word: Transform Boundary

Examples:

San Andreas Fault in California

Doodle:



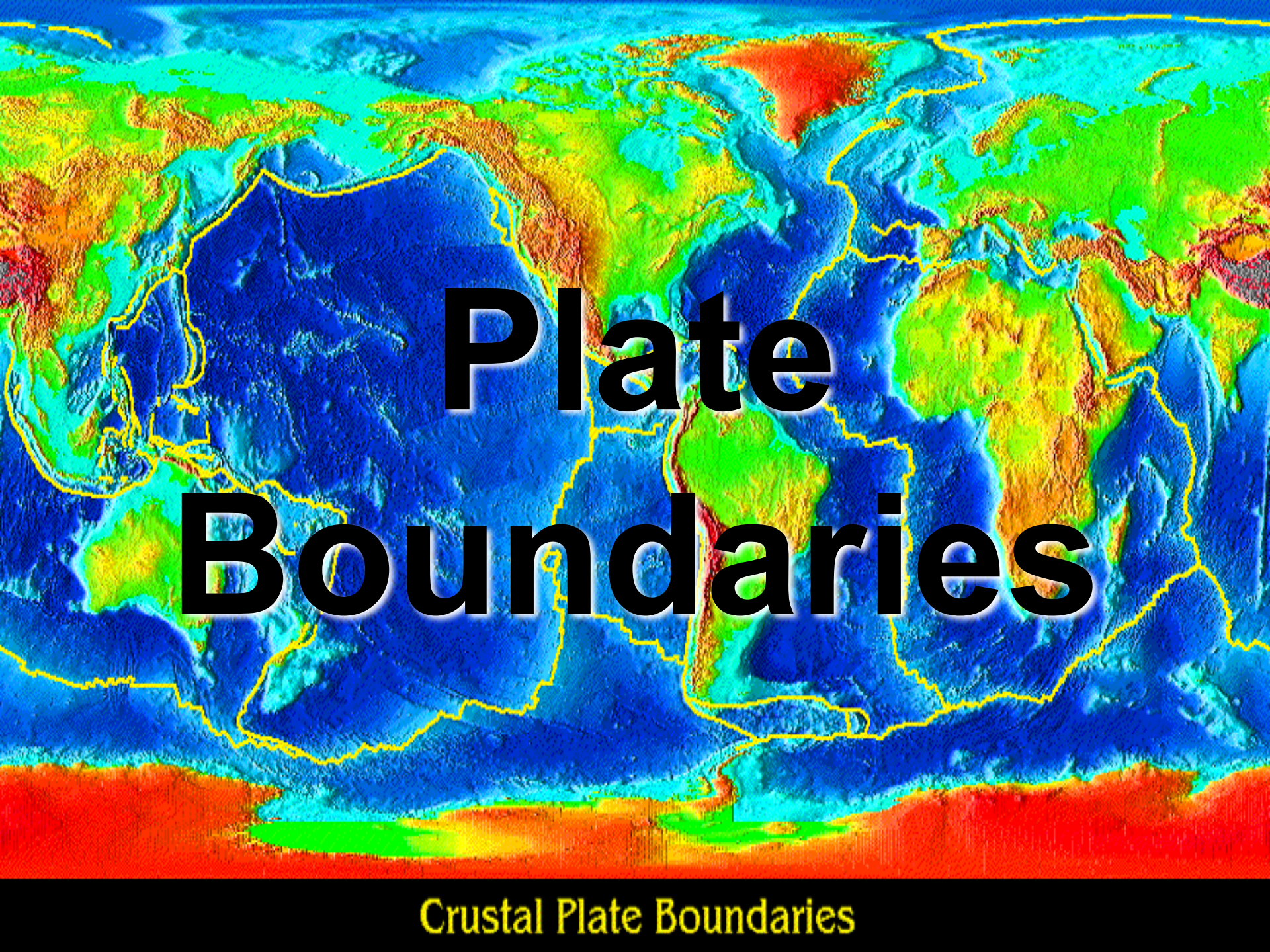


Plate
Boundaries
Crustal Plate Boundaries

2 Types of Plates

- Ocean plates - plates below the oceans
- Continental plates - plates below the continents

Plate Boundaries

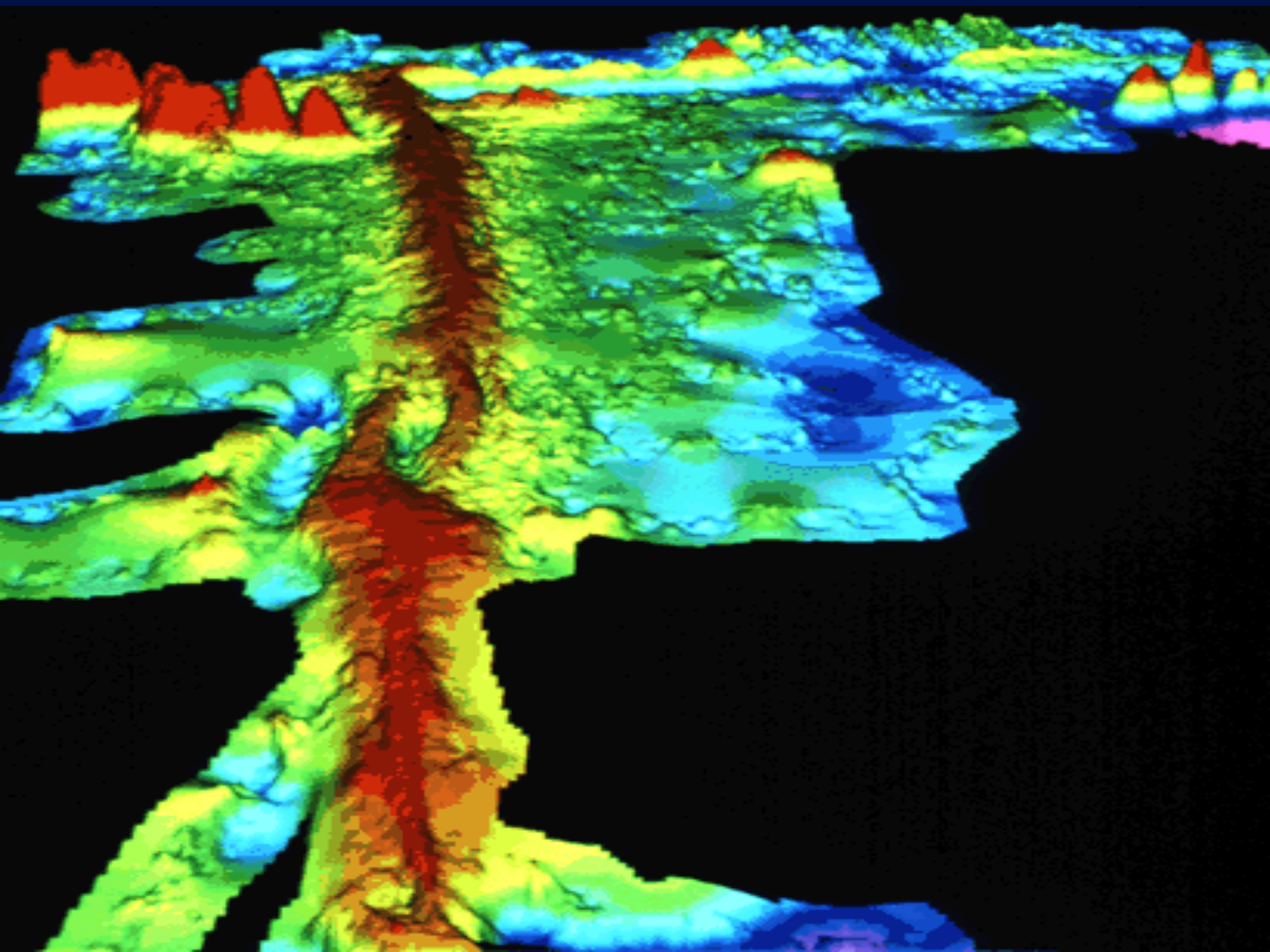
Divergent Boundaries

- Boundary between two plates that are moving apart or rifting

- RIFTING causes SEAFLOOR SPREADING

Features of Divergent Boundaries

- Mid-ocean ridges
- rift valleys
- volcanoes



AFRICA

ATLANTIC OCEAN

EURASIAN PLATE

Persian Gulf

ARABIAN PLATE

Nile River

RED SEA

AFRICAN PLATE (Nubian)

'Erta 'Ale

Gulf of Aden

INDIAN PLATE

Equator

Oldoinyo Lengai

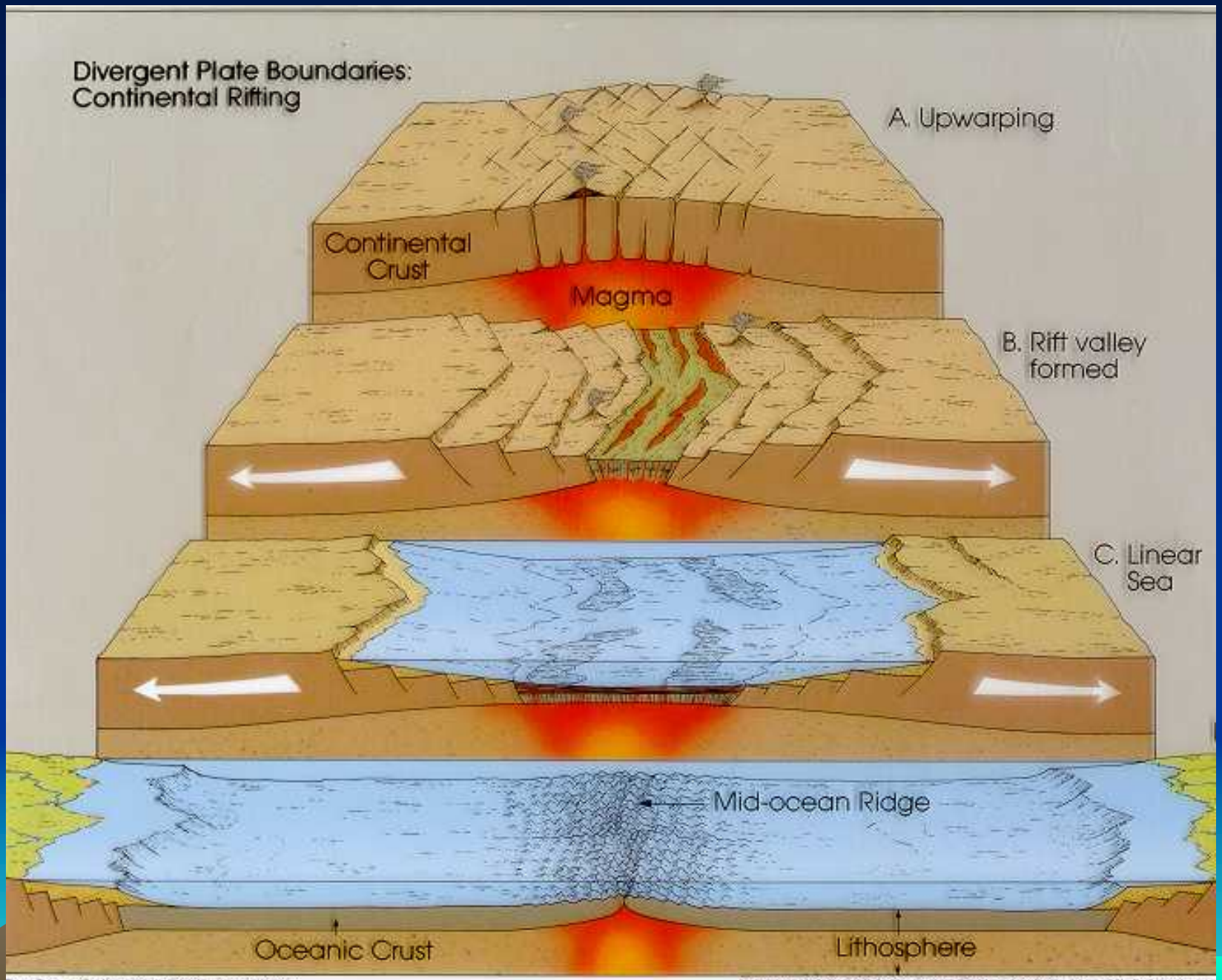
Lake Victoria

AFRICAN PLATE (Somalian)

EXPLANATION

Plate boundaries

East African Rift Zone


Divergent Plate Boundaries:
Continental Rifting
A. Upwarping
Continental Crust
Magma
B. Rift valley formed
C. Linear Sea
Mid-ocean Ridge
Oceanic Crust
Lithosphere
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Convergent Boundaries

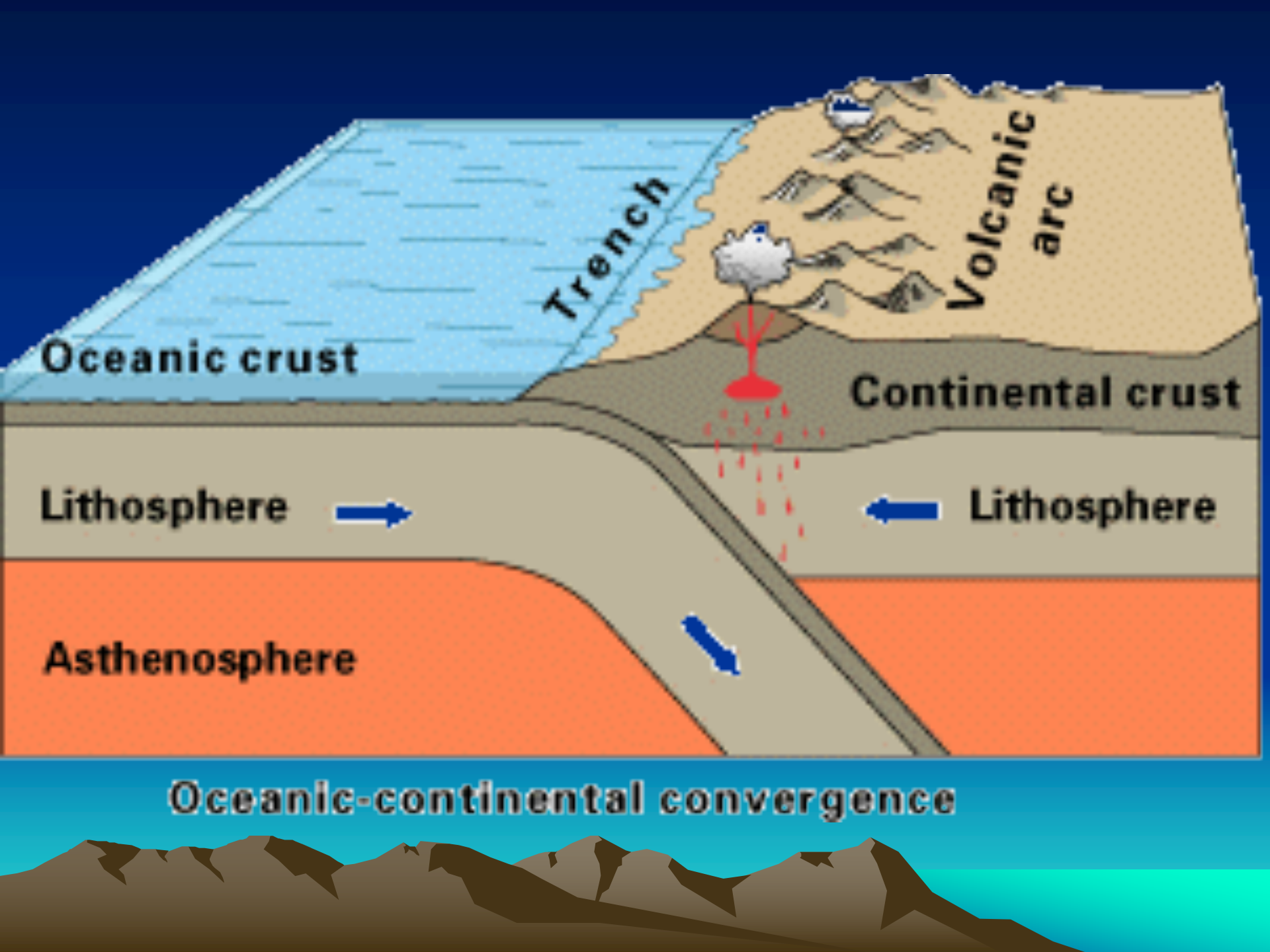
- Boundaries between two plates that are colliding

→ ←

- There are 3 types…

Type 1

- Ocean plate colliding with a less dense continental plate
- Subduction Zone: where the more dense plate slides under the less dense plate
- VOLCANOES occur at subduction zones

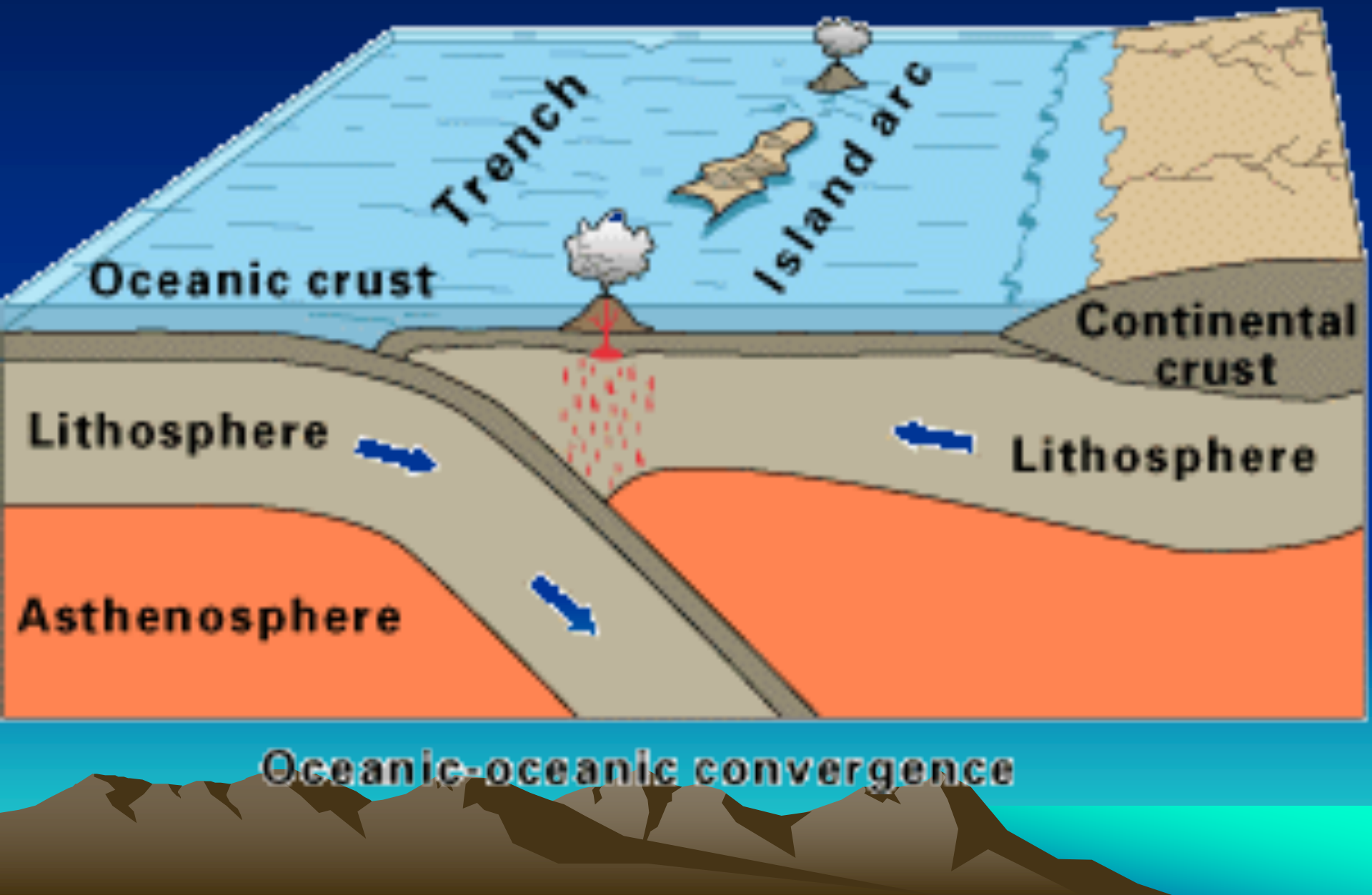


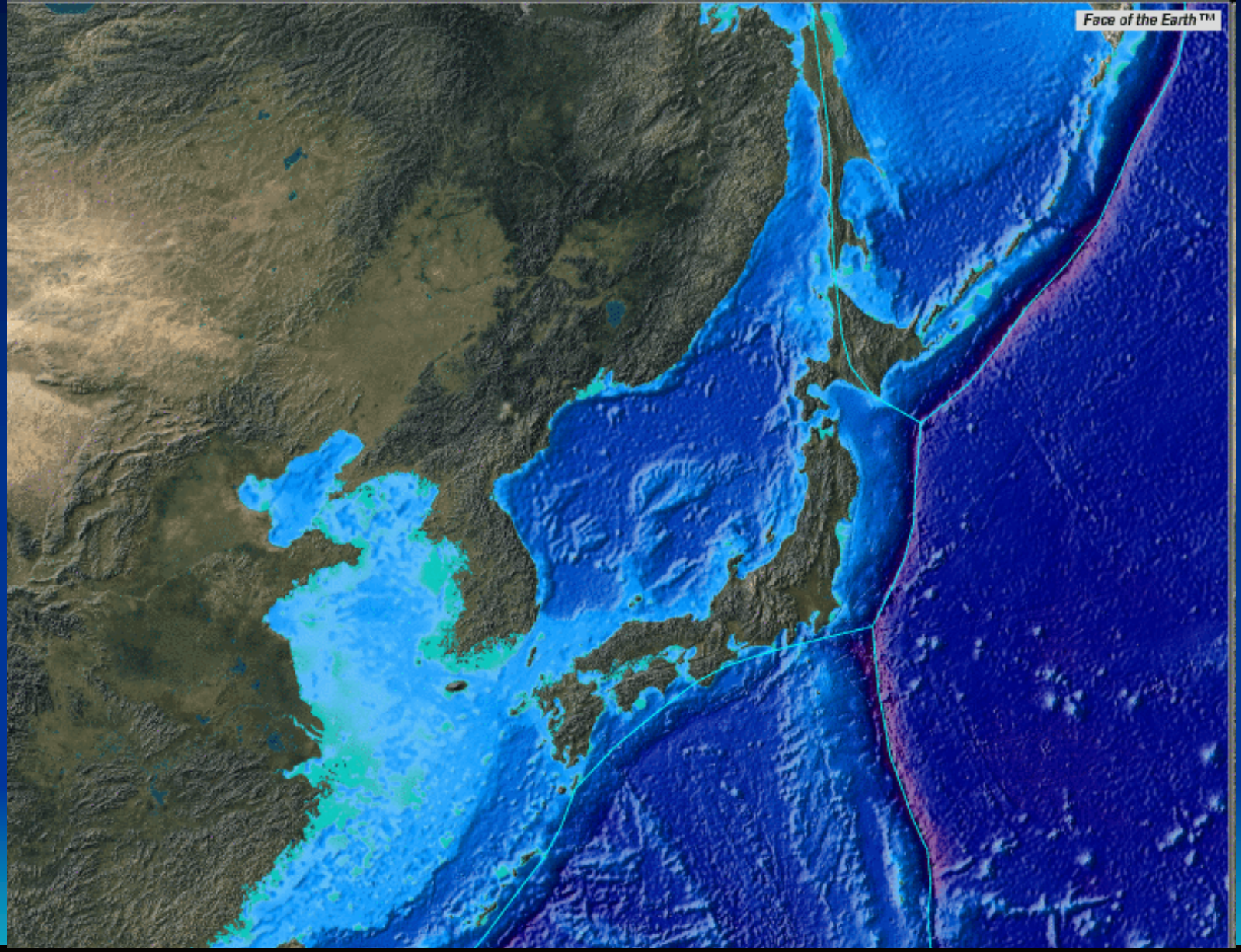
Oceanic-continental convergence

Andes Mountains, South America

Type 2

- Ocean plate colliding with another ocean plate
- The more dense plate slides under the less dense plate creating a subduction zone called a TRENCH
- Also creates island arcs


Trench
Island arc
Oceanic crust
Continental crust
Lithosphere
Lithosphere
Asthenosphere
Oceanic-oceanic convergence



Japan

On November 21, 2013, a new volcanic island appeared south of Japan!

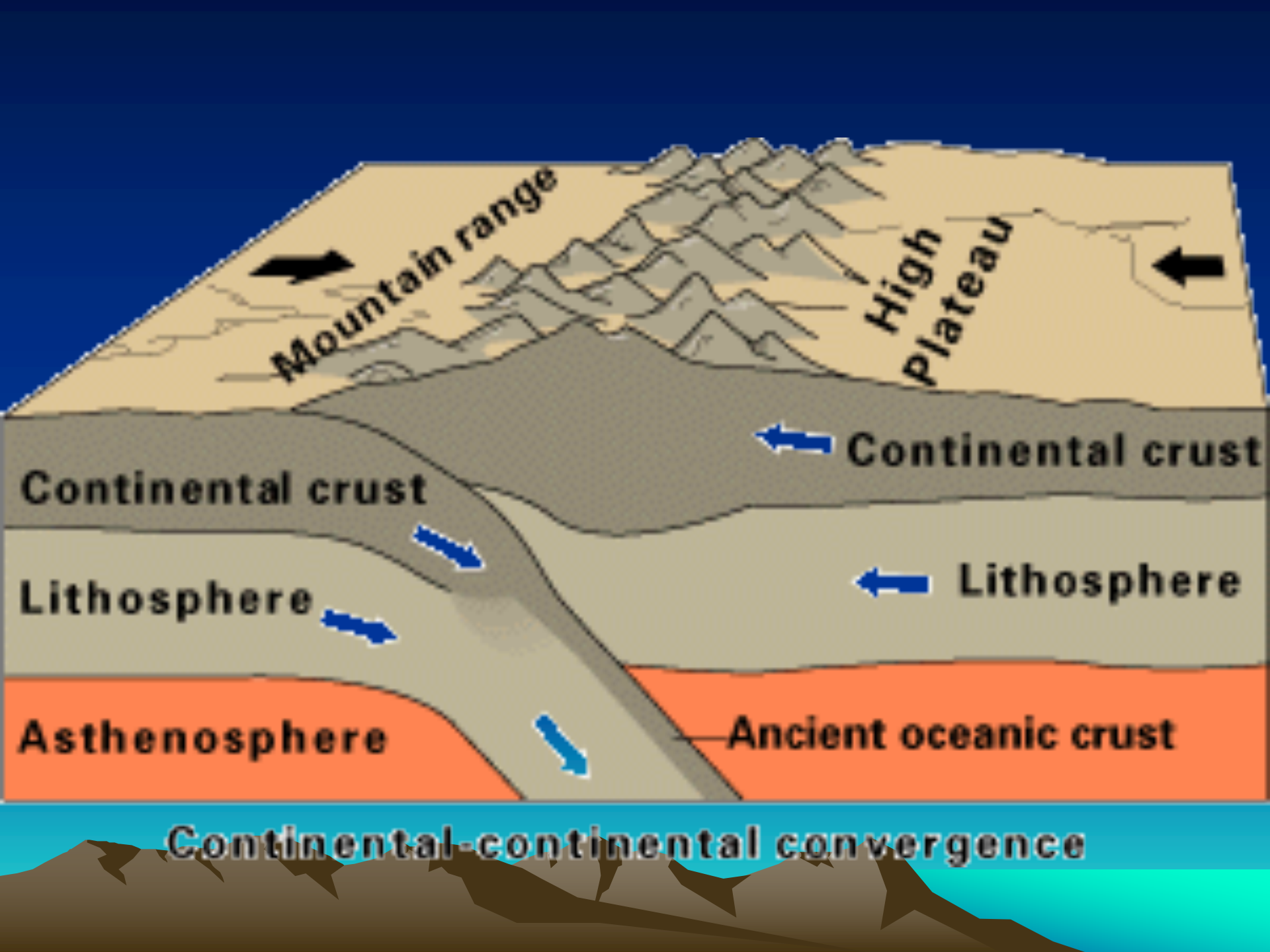
- 5.3 million cubic feet of lava per day
- Ships must stay 3 miles away from the island

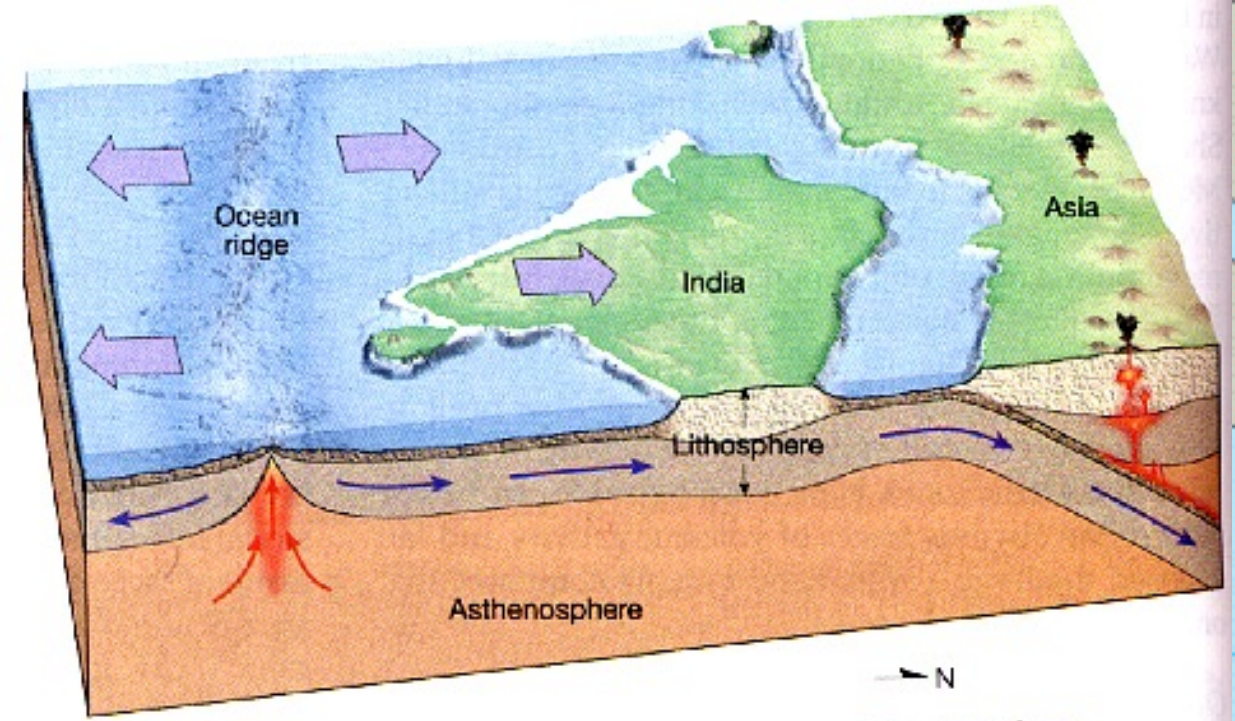
2014

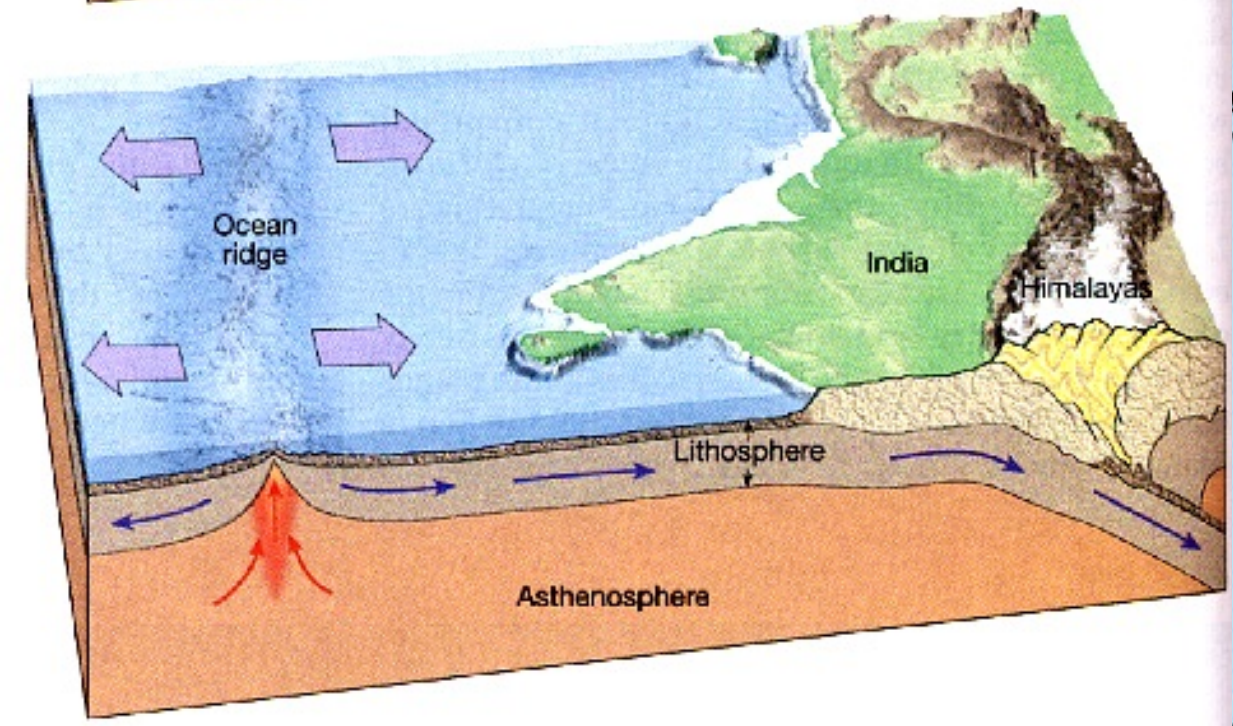
2016

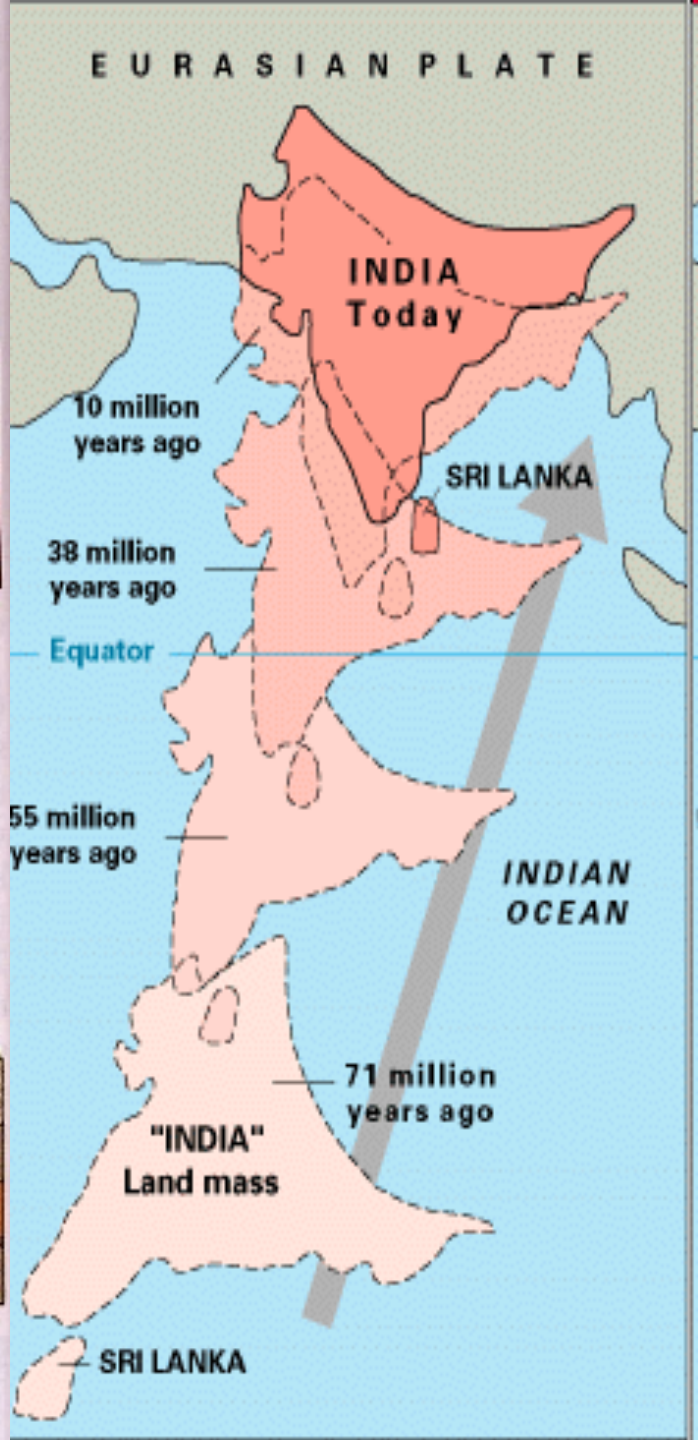
Type 3

- A continental plate colliding with another continental plate
- Have Collision Zones:
  - –a place where folded and thrust faulted mountains form.


Mountain range
High Plateau
Continental crust
Continental crust
Lithosphere
Lithosphere
Asthenosphere
Ancient oceanic crust
Continental-continental convergence


Ocean ridge
India
Asia
Lithosphere
Asthenosphere


Ocean ridge
India
Himalayas
Lithosphere
Asthenosphere


EURASIAN PLATE
INDIA Today
10 million years ago
SRI LANKA
38 million years ago
Equator
55 million years ago
INDIAN OCEAN
71 million years ago
"INDIA" Land mass
SRI LANKA

The Himalayan Mountains

Transform Fault Boundaries

- Boundary between two plates that are sliding past each other
- EARTHQUAKES along faults

San Andreas Fault, CA

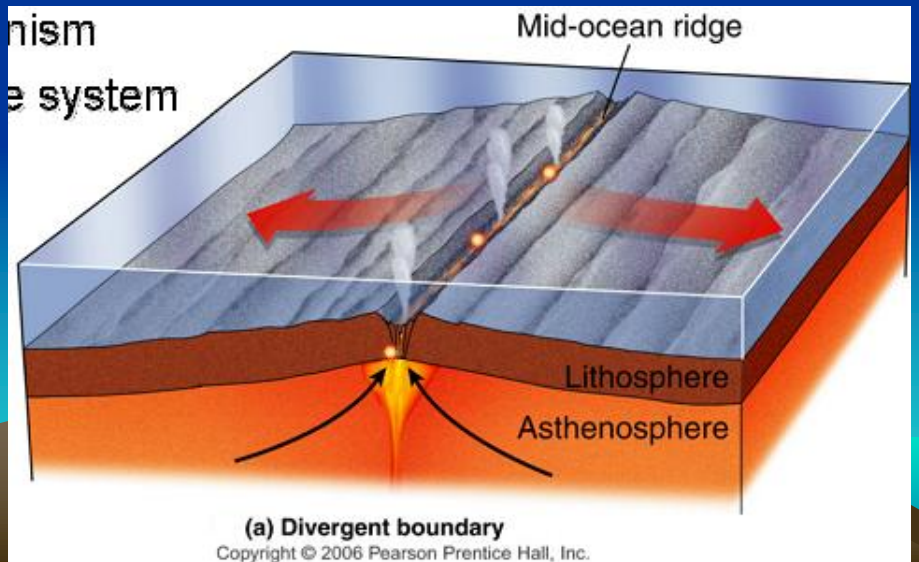
Questions...

- What are the three types of boundaries?
- What direction do plates go for each?
- Which boundary has a subduction zone…what occurs at a subduction zone?

Factors that Cause Tectonic Plate Movement

1. Gravity

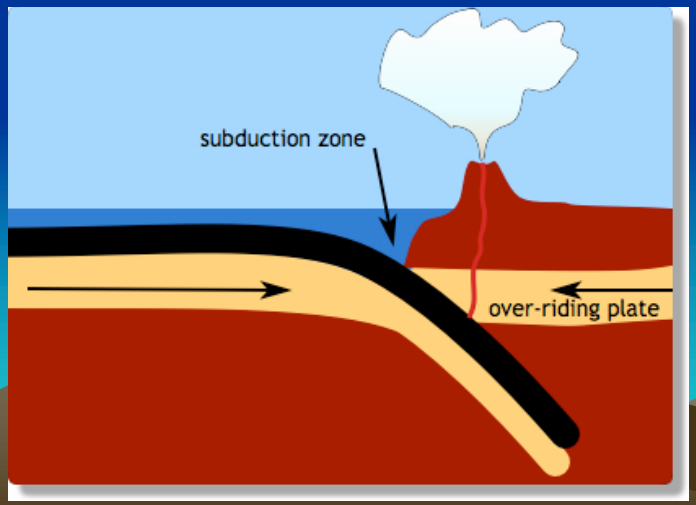
- Earth's gravitational force is always pulling objects toward the center of the earth, even the tectonic plates.
- This is most noticeable on an oceanic crust, where the ridge is "uphill" from the trench.



2. Density

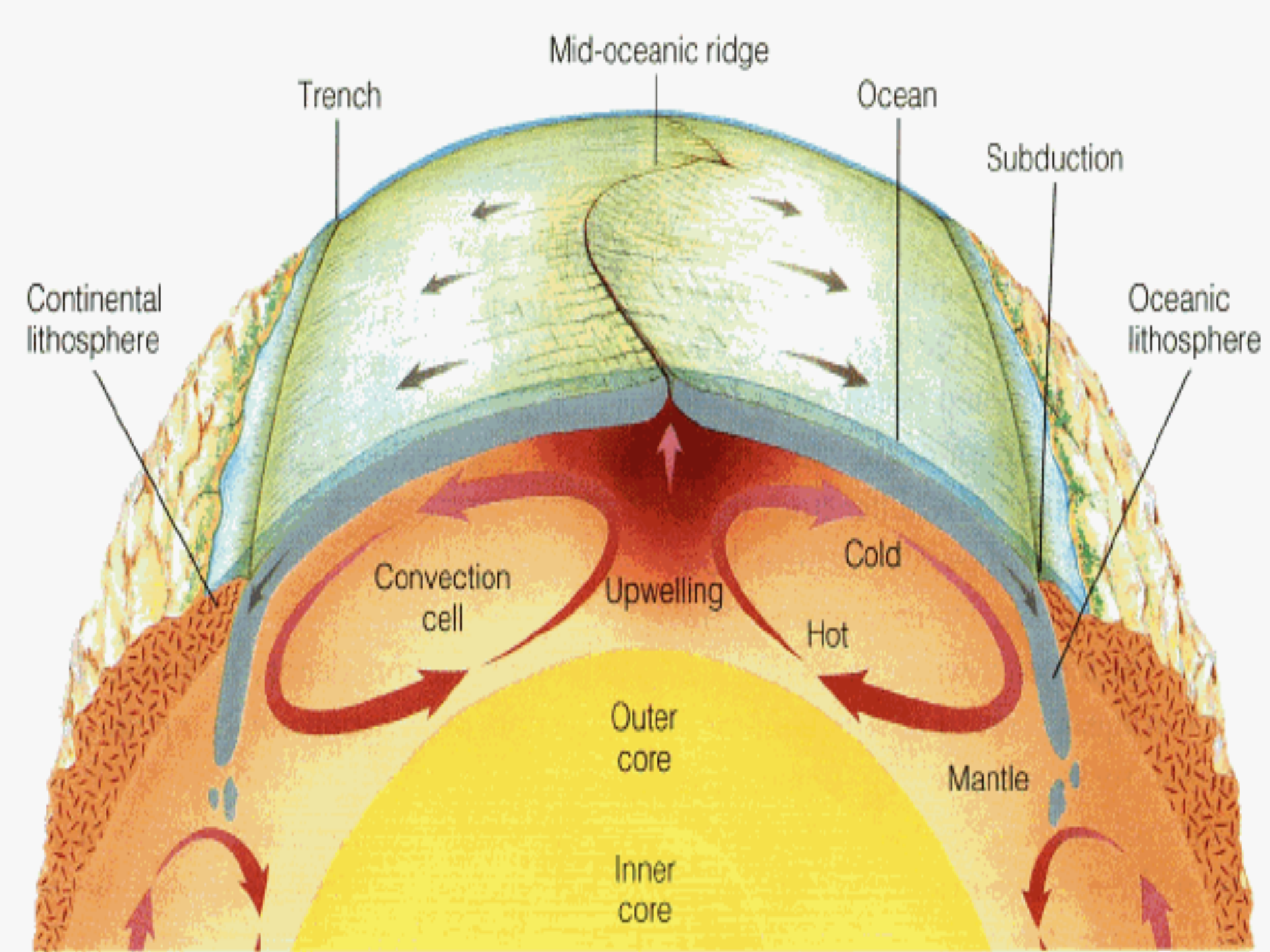
The more dense a plate is, the more likely it is to sink.

Oceanic Plates are denser than Continental Plates. This is why oceanic plates are subducted underneath continental plates.



Convection Currents

- Hot magma in the Earth moves toward the surface, cools, then sinks again.
- Creates convection currents beneath the plates that cause the plates to move.


Mid-oceanic ridge
Trench
Ocean
Subduction
Continental lithosphere
Oceanic lithosphere
Convection cell
Upwelling
Cold
Hot
Outer core
Mantle
Inner core

Questions...

- What causes plates to move?
- How is a convection current formed?

HOW ABOUT A LITTLE QUIZ?