Warm-up Week 14 Day 1

1. The convergence of two continental plates would produce _____

   a. folded mountains. c. island arcs.

   b. rift valleys. d. trenches.

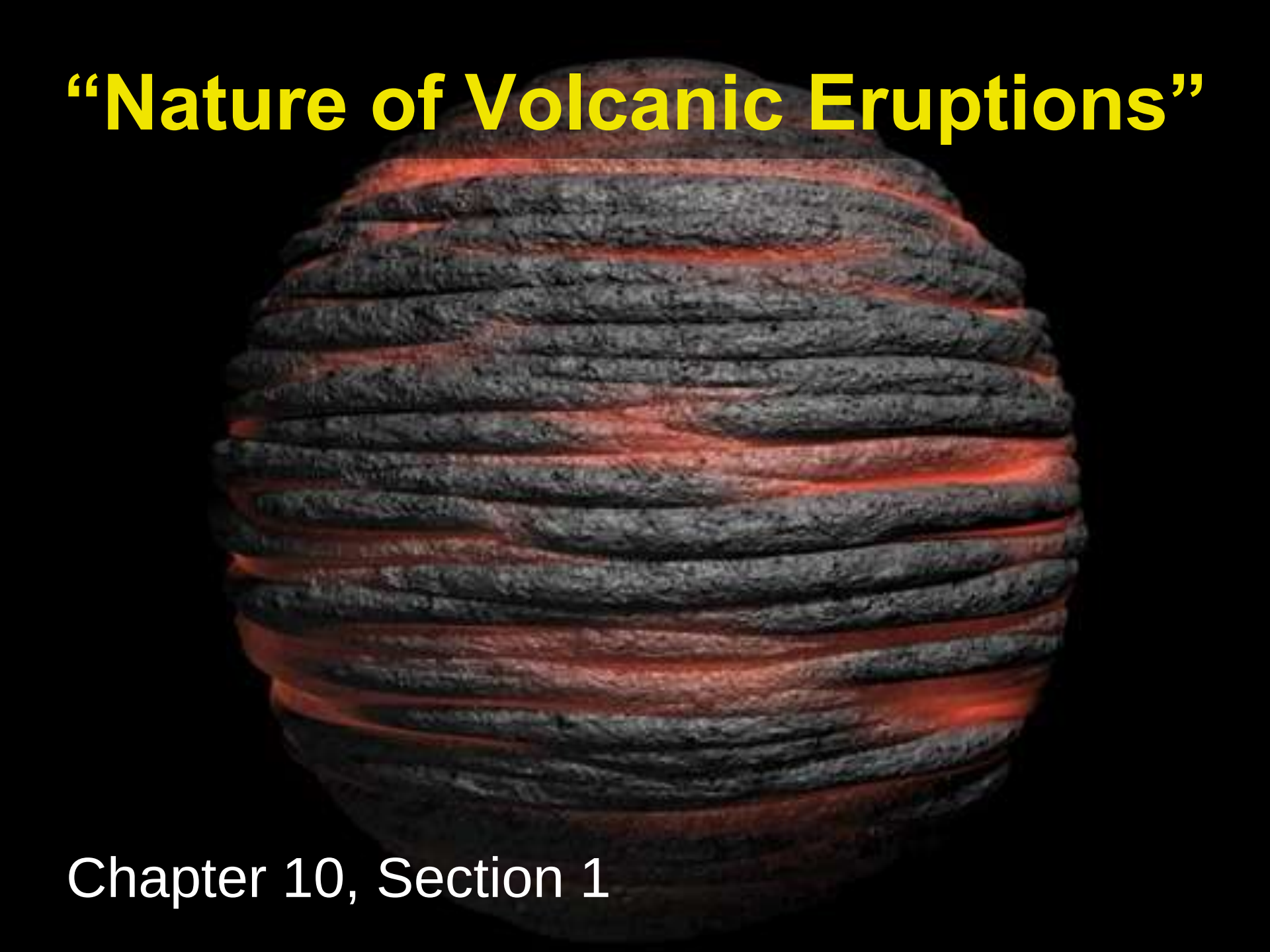
---

2. _____ hypothesis states that the continents were once joined to form a single supercontinent.

   a. seafloor spreading c. Paleomagnetism

   b. continental drift d. plate tectonics

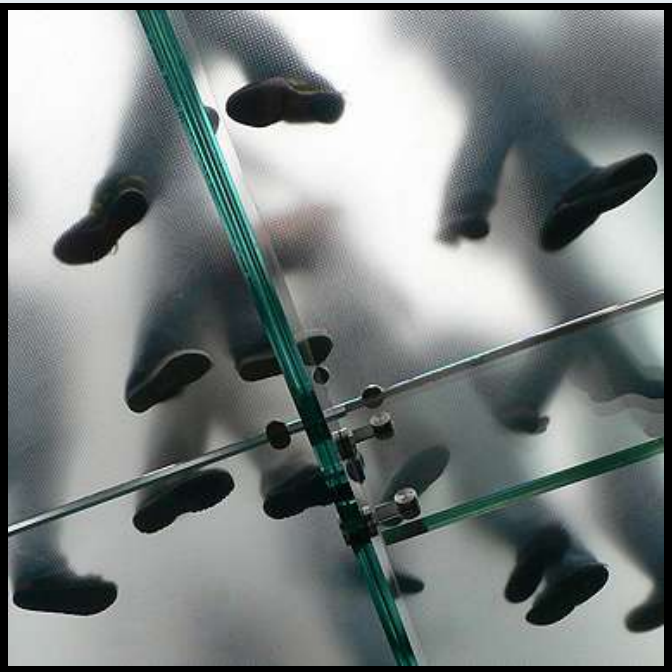
“Nature of Volcanic Eruptions”



Chapter 10, Section 1

Q: What do we know about volcanoes?

Windows to below…



Observe processes from center of Earth

Mt. Saint Helens

- May 18, 1980
- Huge blast
- Km^3 of Ash → air
- Day turned to night for 130 Km

Kilauea, Hawai'i

- Gentle
- Non-threatening

Q: Why are some Volcanoes explosive, but others are not?

Violent or Gentle Eruption?...

1. **Magma Composition**
   - What it's made of
   - **Viscosity**
     - **Resistance to flow**
     - **Stickiness**

2. **Magma Temperature**
   - **↓ Temp = ↑ Viscosity = Slower Moving**

3. **Amount of Dissolved Gases**

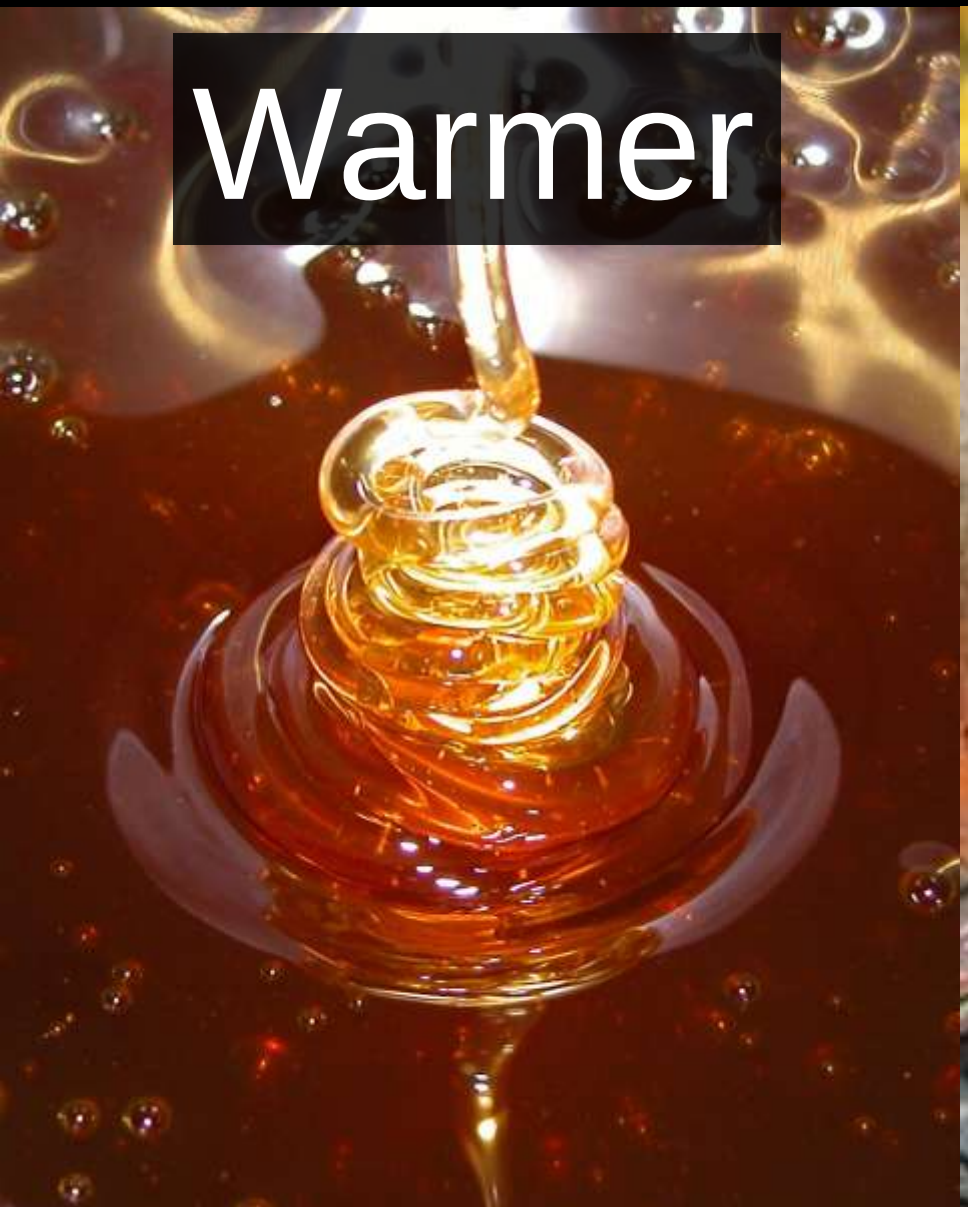
Magma Composition

Table 1 Magma Composition

Composition	Silica Content	Viscosity	Gas Content	Tendency to Form Pyroclastics (ejected rock fragments)	Volcanic Landform
Basaltic	Least (~50%)	Least	Least (1–2%)	Least	Shield Volcanoes Basalt Plateaus Cinder Cones
Andesitic	Intermediate (~60%)	Intermediate	Intermediate (3–4%)	Intermediate	Composite Cones
Rhyolitic	Most (~70%)	Greatest	Most (4–6%)	Greatest	Pyroclastic Flows Volcanic Domes

- **Silica = Glassy**
- **More Silica = More Viscous**
- **Slower Movement**

Temperature…



Dissolved Gases

• **Water Vapor**	**70%**
• **CO_2**	**15%**

1. **Magma** moves **away** from **center of Earth**
2. **Pressure ↓**
3. **Gas** can **escape**
4. **Gas** gets **trapped** in **Viscous Magma**
5. **Escapes** through a **VENT**
6. **Explosion!**

Q: Describe the flow of cooler Lava with very little silica content.

Volcanic Material

1. **Lava Flow**
   - Molten rock
   - Basaltic: ↓ Silica = Fast!
   - Rhyolitic: ↑ Silica = S-l-o-w.
2. **Gases**
   - Decrease in pressure allows gas to escape.
   - Volcanic gases formed our early atmosphere
3. **Pyroclastic Material**
   - What's erupted.

Volcanic Material

Pahoehoe Lava Flow

Pyroclastic Material

Anatomy of a Volcano

1. **Fissure** (crack) in crust
2. **Magma rises** toward surface
3. **Deposits** igneous rock **around VENT**

Volcano

Mountain built by repeated eruptions of lava or pyroclastic material.

Crater

Steep-walled depression at the top of volcano

Anatomy…

Caldera

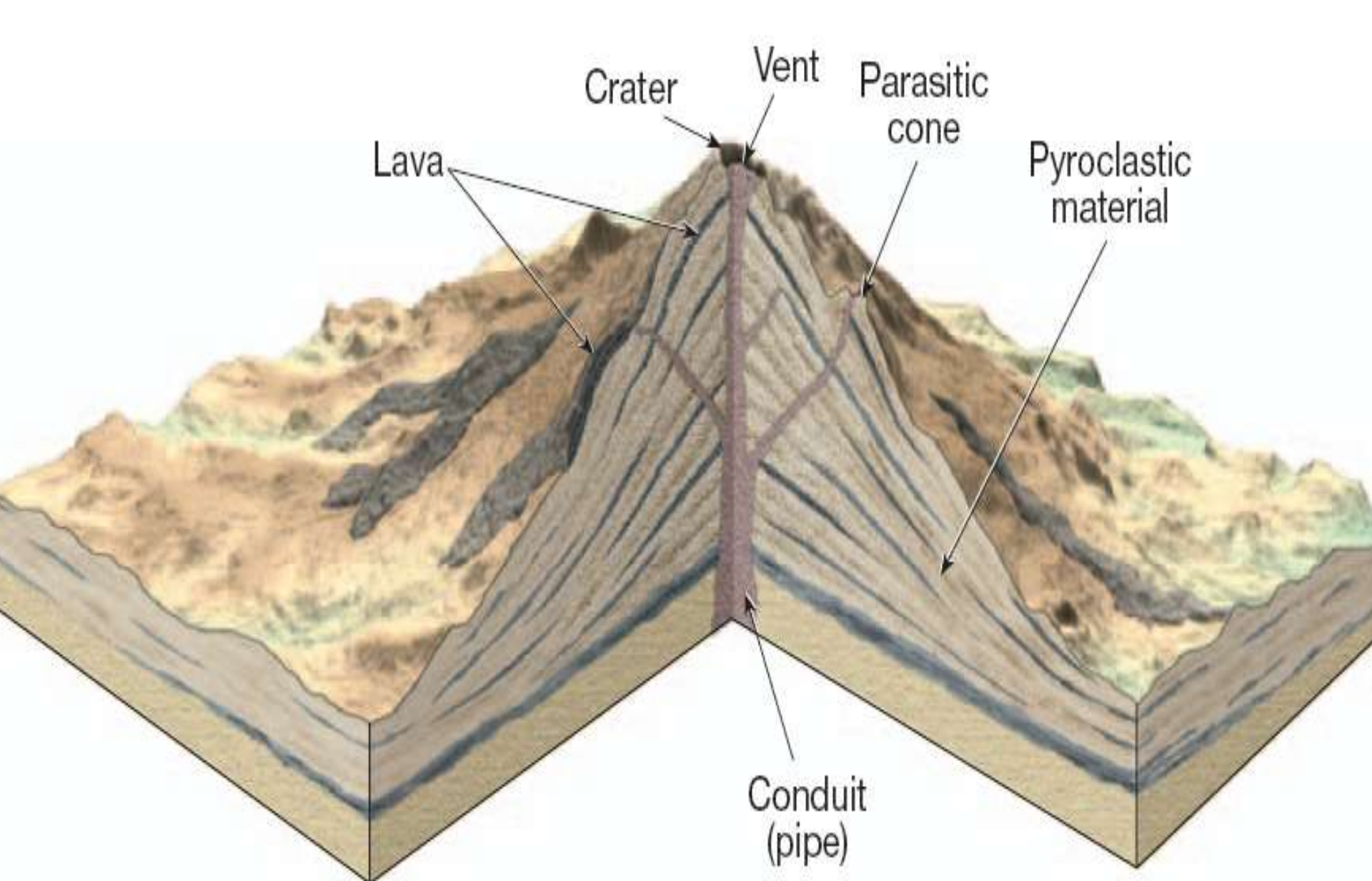
Large depression, caused by collapse of top.

Necks & Pipes

Pipes feed magma to surface.

Necks can be left standing due to erosion.

Inside a Volcano.



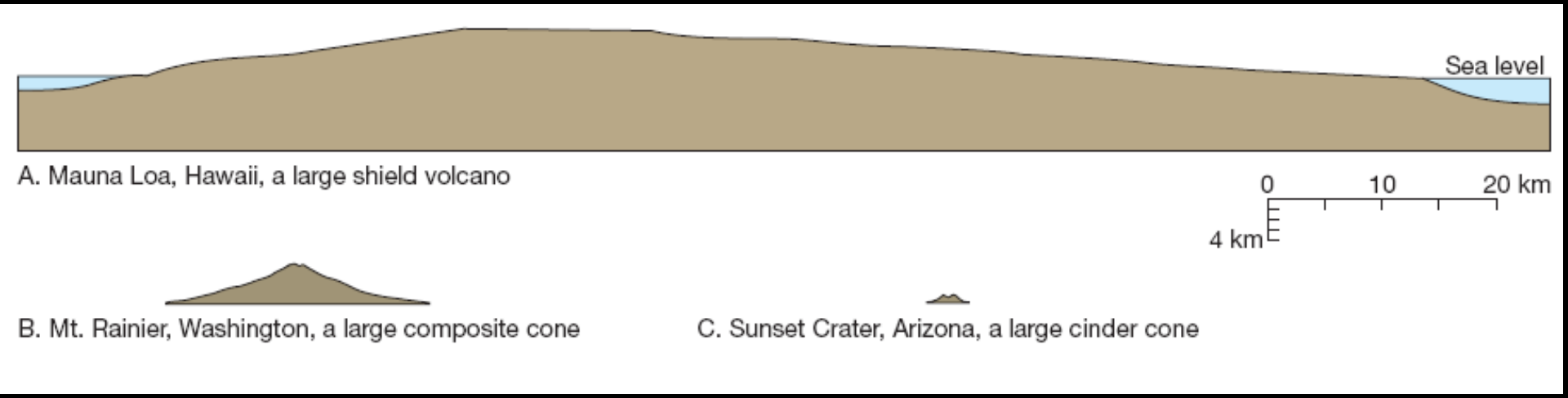
3 Volcano Types:

1. Shield Volcano

2. Cinder Cone

3. Composite Cones

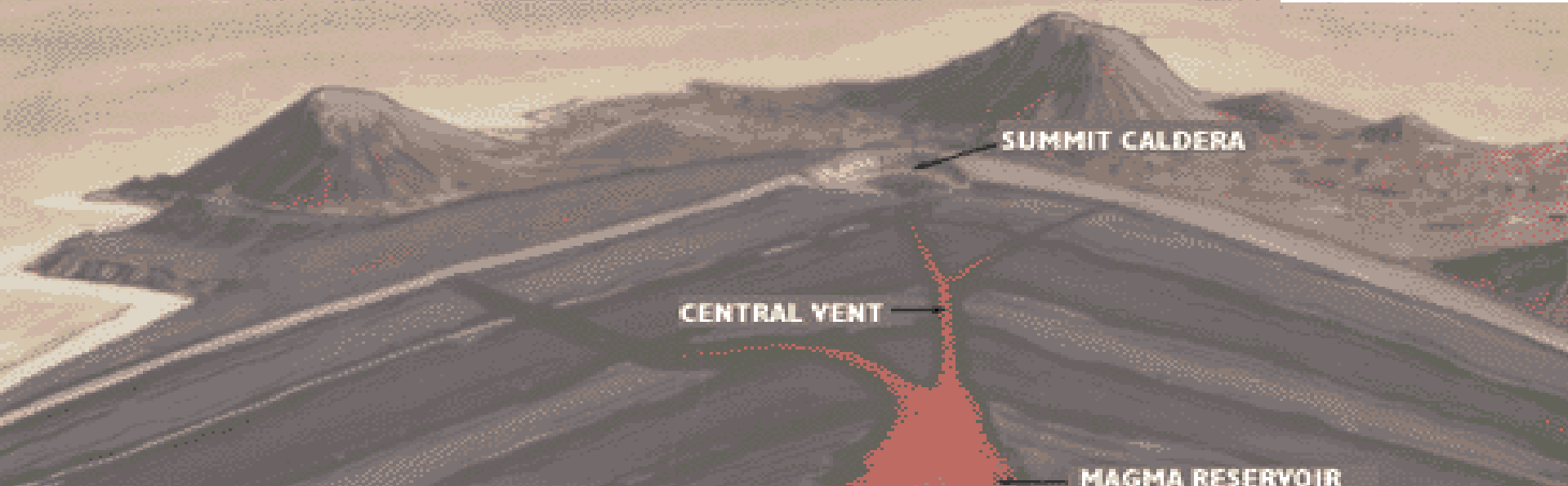
Profiles of Volcanic Landforms



Shield Volcanoes

- **Fluid, fast, basaltic lava**
- **Warrior's shield**
- **Broad, slightly domed**
- Most have grown from the ocean-floor to form islands (Hawaii and Iceland)

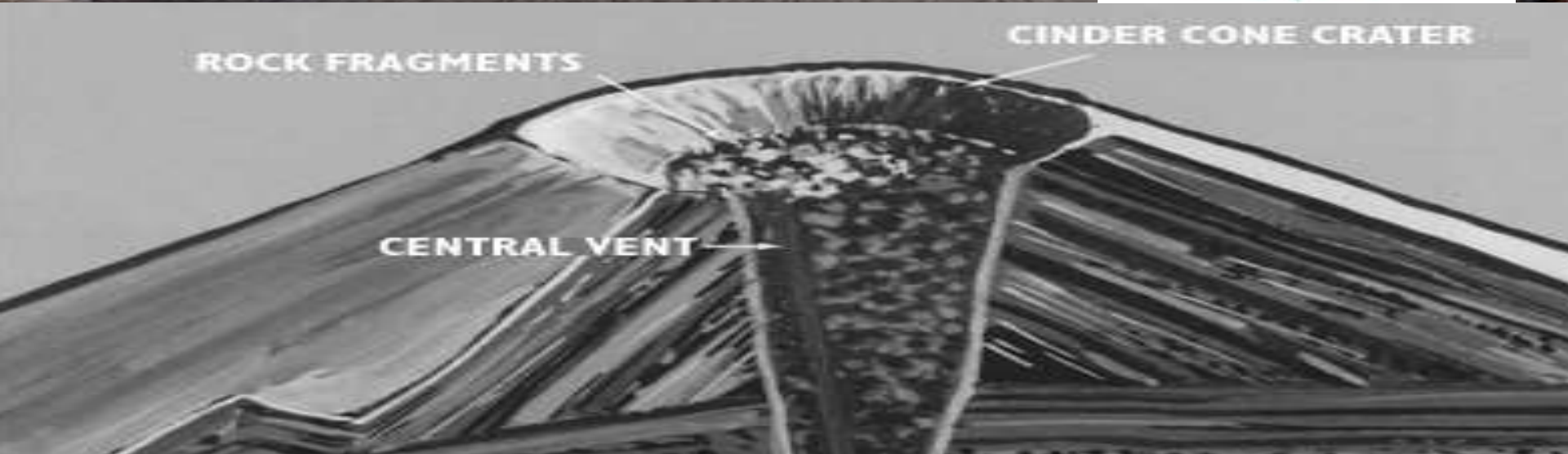
Shield Volcanoes



Cinder Cones

1. Lava fragments that harden in the air.
2. Loose pyroclastic material comes to rest.
3. Steep-sided slope (salt mound)

Cinder Cones



Composite Cones

"Stratovolcano"

- Large, symmetrical (ice-cream cone)
- Layers of lava & pyroclastic material

- **Lahar**
  - destructive mudflow


Composite Cones
FILLED CENTRAL VENT
RADIATING DIKES
PYROCLASTIC LAYERS
LAVA FLOWS

Volcano Graphic Organizer (20pts)

Assignment:

Organize the vocabulary words at the top of p. 280 into a poster that satisfies the following requirements:

1. **Illustrate & Create analogies** representing the 3 volcano types (10pts)
2. **Include all 9 vocabulary words** 1.) labeled, and 2.) defined. (5 pts)
3. **Originality:**

   don't copy your neighbor's (5pts)

Creating an Analogy

- **Analogy:**
  - A similarity between like features of two things, on which a comparison may be based.
  - Ex: Lava is **like** Earth's blood **because** it leaks out when there is a hole in the surface and cools into a scab-like ridge.