**Review: Do You Know?**

**Directions:** Carefully read over the checklist of items that you need to know for the midterm exam.

**EARTH SCIENCE FOUNDATIONS**

**OBSERVATION AND INFERENCE:**
- Classification systems are based on observations and help organize observations
- Inferences are an interpretation based on an observation
- Observations are recorded observations using the five senses
- The 5 senses: sight, smell, hearing, taste, and touch

**MEASUREMENT**
- Terms to Know: length, mass, volume, displacement, temperature, air pressure
- Measuring Instruments: electric balance, ruler, graduated cylinder
- Be able to calculate volume using \( V = l \times w \times h \)
- Be able to measure volume using displacement

**DENSITY**
- Terms to Know: density
- Earth Science Reference Tables: Equations [Density]
- Know how to calculate Density with the proper units
- All substances are the densest in the solid phase… except water
- Solid water [ice] floats in liquid water… so it is less dense
- Density remains the same for a material unless heat or pressure is changed
- If temperature increases then density will decrease
- If pressure increases then density will increase

**GRAPHING ANALYSIS**
- Terms to Know: extrapolate, dependent variable, independent variable
- Recognize a graph of a “direct relationship” and provide example[s]
- Recognize a graph of an “inverse relationship” and provide example[s]
- Recognize a graph of a “cyclic change” and provide example[s]
- Earth Science Reference Tables: Equations [Rate of Change]
- Know how to calculate Rate of Change with the proper units
- Graphs reveal patterns can be used to extrapolate data to help predict future events
MEASURING THE EARTH

SPHERES OF THE EARTH:
- Terms to Know: lithosphere, atmosphere, hydrosphere
- ESRT Chart: Average Chemical Composition of Earth’s Crust, Hydrosphere, and Troposphere
- ESRT Chart: Selected Properties of Earth’s Atmosphere
- ESRT Chart: Inferred Properties of Earth’s Interior

LATITUDE AND LONGITUDE
- Terms to Know: latitude, equator, longitude, prime median, international date line
- Max Latitude = 90°
- Max Longitude = 180°
- Altitude of Polaris = Latitude [northern hemisphere]
- As latitude increase… altitude of Polaris increases
- ESRT Chart: Generalized Bedrock Geology of New York State
- Earth’s rotation is the basis for local time and Earth’s rotation 360° in 24 hours = 15°/hour
- Each time zone covers 15° of longitude

FIELD MAPS AND ISOLINES
- Terms to Know: field, isoline, isotherm, isohyet, isobar, contour line
- Isoline Rules:
  - Connect equal points of data
  - Close around hills and depressions or extend to the map border
  - Isolines never cross one another

TOPOGRAPHIC MAPS AND PROFILES
- Terms to Know: elevation, topographic map, contour line, contour interval, contour index, depression contour lines, topographic profile
- Steep slope = contour lines close together
- Gentle slope = contour lines far apart
- Contour lines bend the opposite direction when they cross a stream or river
- Know how to interpret/read a topographic map
- Know how to calculate the possible max or minimum elevation
- Know how to create a profile
MINERALS AND ROCKS

MINERALS
- Terms to Know: luster, cleavage, fracture, hardness, streak
- Internal Arrangement of Atoms
- The basic mineral structure is a silicon-oxygen tetrahedron
- Earth Science Reference Tables: Properties of Common Minerals

IGNEOUS ROCKS
- Terms to Know: vesicular, volcanic, plutonic, intrusive, extrusive
- The longer the cool the bigger the jewel
- Very Coarse and coarse grain cooled inside the Earth
- Fine grain and Glass cool outside the Bath
- Earth Science Reference Tables: Scheme for Igneous Rock Identification
- Formation: melting $\rightarrow$ magma $\rightarrow$ solidification

SEDIMENTARY ROCKS
- Terms to Know: clastic, fragmental, fossil, precipitates, evaporites, lithification
- Other terms for Sediment: clastic, fragmental, particles, pieces
- Earth Science Reference Tables: Relationship of Transported Particle Size to Water Velocity
- Form in layers
- Could contain fossils
- Earth Science Reference Tables: Scheme for Sedimentary Rock Identification
- Formation: weathering & erosion $\rightarrow$ sediment $\rightarrow$ deposition & burial $\rightarrow$ cementation and/or compaction

METAMORPHIC ROCKS
- Terms to Know: foliated, nonfoliated, banding, mineral alignment, banding
- Contact metamorphism [large scale] form by heat and pressure
- Regional metamorphism [small scale] form from just heat
- Earth Science Reference Tables: Scheme for Metamorphic Rock Identification
- Formation: heat and/or pressure

THE ROCK CYCLE
- Igneous: melting $\rightarrow$ magma $\rightarrow$ solidification
- Sedimentary: weathering & erosion $\rightarrow$ sediment $\rightarrow$ deposition & burial $\rightarrow$ cementation and/or compaction
- Metamorphic: heat and/or pressure
- Driving Forces: heat from Earth’s interior, energy from the Sun, gravity
- Earth Science Reference Tables: Scheme for Metamorphic Rock Identification
PLATE TECTONICS

CONTINENTAL DRIFT
- Terms to Know: Continental Drift, Pangaea, Mesosaurus, Glossopteris
- Evidences to support the Theory of Continental Drift:
  - Puzzle-like fit of Africa’s west coast and South America’s east coast
  - Fossil remains of the Mesosaurus were found in South America and South Africa
  - Fossil remains of the Glossopteris found throughout India, S. America, Africa, and Antarctica

CRUSTAL ACTIVITY
- Terms to Know: Plate Tectonics, Plates, Lithosphere, Asthenosphere
- Convection Currents are the driving force behind plate movement
- Evidences of Plate Tectonics:
  - Earthquakes along isolated belts outlining the plate boundaries
  - Volcanoes occurring at plate boundaries where plates are interacting
  - Tilted and/or folded rock layers that were initially deposited horizontally
  - Mountains that were pushed up from plate collisions
  - Fossilized shallow marine organisms found at high elevations
- Ring of Fire is an isolated belt around the Pacific Ocean where 90% of the world’s volcanoes exist

CRUSTAL BOUNDARIES
- Terms to Know: convergent, divergent, transform, subduction, trench, mid-ocean ridge, rift valley
- Earth Science Reference Tables: Tectonic Plates
- Convergent Plate Boundary [← →] Features: trenches, mountains, island arcs, volcanoes
- Divergent Plate Boundary [← →] Features: mid-ocean ridge, rift valley, magnetic striping
- Sea-floor Spreading is the process where ocean floor is extended when two plates move apart
- Transform Plate Boundary Example: San Andreas Fault

VOLCANOES AND HAZARDS
- Terms to Know: volcano, caldera, pyroclastic flow
- Hotspot - thinner portions of the crust where rising convection currents bring magma to the surface
- Emergency Preparedness: evaluate