

Unit 2 Exam Review Guide

These are the core ideas that you should understand for your exam. If you thoroughly understand all of these concepts, you are in excellent shape for the exam.

Past Units

The following information learned in past units will be especially helpful to you in understanding this new material:

You should know how to:

- Calculate density given mass and volume.

You should understand:

- The basic concept of density.
- Why objects sink or float.
- The concept of buoyant force and how it relates to sinking/floating.
- The concept of heat transfer.
- How density changes with temperature.
- How density changes with pressure.

Earth At A Glance

You should be able to:

- Calculate distance between two points on a scaled map based on the actual distance and the scaling factor.
- Identify **cylindrical**, **cylindrical equal-area**, **oval**, **interrupted**, and **perspective** maps based on their appearance.
- Identify **political**, **physical**, and **topographical** maps based on their appearance.

You should understand:

- The pros and cons of **cylindrical**, **cylindrical equal-area**, **oval**, **interrupted**, and **perspective** maps and **globes**
 - Be able to recognize and define **polar distortion**
- The pros and cons of **political**, **physical**, and **topographical** maps.

Layers of the Earth

You should be able to

- Name the layers of the Earth in order of how they are arranged.
- Describe the composition of the layers (what they are made of).

You should understand:

- How/why the Earth has layers: **differentiation/particle sorting** (sinking of denser objects) and **gravity** (heavier objects being pulled toward the center)

- How/why temperature varies between the layers.
- How density changes between layers and why density follows this pattern.
- The unique properties of some the layers and the phenomena they give rise to:
 - Movement of the mantle due to **convection** (cycling of hot/cold magma) and carbon dioxide escape causing movement of the plates above them
 - Movement in the outer part of Earth's iron core causing magnetic field
 - Atmosphere: see atmosphere lesson

Plate Tectonics

You should be able to:

- Identify **convergent, divergent, and transform** boundaries.
- Identify the events that occur at **convergent, divergent, and transform** boundaries

You should understand:

- Understand how and why those specific events occur at the boundaries where they do
- Understand why plates move, including why the mantle beneath them moves.
- Understand the principle of **continental drift**, including that it is still happening and that the continents were once one large supercontinent called Pangea

Rocks and Minerals

You should be able to:

- Classify rocks as **sedimentary, metamorphic, igneous, or minerals** (rather than rocks) based on their physical appearance.

You should understand:

- The difference between rocks and **minerals**.
- How **sedimentary, metamorphic, and igneous** rocks form.
- The general trend of density among **sedimentary, metamorphic, and igneous** rocks, as well as minerals (i.e., which of these is most dense? Least? Can we always know for sure based on the classification alone?).
- Why density follows this trend.

Particle Sorting

You should be able to:

- Predict how a particle will sort in still water, given a certain density or size (when the other is held constant/similar)
- Predict how a particle will sort in moving water (i.e., on a shoreline), given a certain density or size (when the other is held constant/similar)

You should understand:

- The patterns of particle sorting in still water (i.e., rocks sinking), moving water (i.e., a wave depositing rocks on the shore), and dry mixtures (i.e., sand seeping through cracks).
- How particle sorting in each of these scenarios is related to size/density, surface area, and density.
- The underlying principles of particle sorting in all of these scenarios: be able to explain *why* particles sort the way they do in a variety of circumstances, beyond just being able to identify the general trend of where they end up.

The Atmosphere

You should be able to:

- Name the layers of the atmosphere and in order of how they are arranged.
- Identify a unique property of or phenomenon present in each of the layers (e.g., where airplanes fly, where clouds form, etc.)
- Name the gases that make up the majority of the atmosphere and approximately what percentage of the atmosphere they comprise.

You should understand:

- How density varies through the atmosphere; be able to identify the general trend and explain why that trend is present.
- How/why temperature varies through the atmosphere in each of the layers.
- The general trend of how earth's lifeforms have shaped the atmosphere from the early days of Earth (especially **cyanobacteria** and plants producing oxygen).
- How earth's lifeforms allow the atmosphere to maintain a constant composition through the **carbon** and **nitrogen cycles**. You do not need to know the precise details of these cycles, beyond:
 - **Carbon cycle:** plants use carbon dioxide and make oxygen, while animals use oxygen and make carbon dioxide.
 - **Nitrogen cycle:** plants and animals make nitrogen waste products, which bacteria turn into atmospheric nitrogen.
- The impact of **climate change** on the environment in the short and long term, including its effect on severe weather patterns.
- The causes of **climate change** and how these relate to the **greenhouse effect**.
- The basic principles of what causes a **thunderstorm**, a **hurricane**, and a **tornado**. You should have a sense of the extent of damage that each of these can cause.
- The consequences of pollution (**smog**, **acid rain**, and **ozone depletion**) for humans and/or other species.
- The role of **ozone** in the atmosphere.