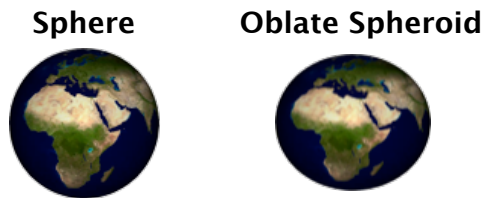


PROOF THAT THE EARTH IS ROUND

- › **The Sinking Ship**– Ships appear to sink as they pass the horizon, but they are actually just traveling around the curved surface of the Earth.
- › **Lunar Eclipses**– Notice the curved shadow of Earth; it must be round!
- › **Skyline Sunset**– The tops of the buildings are still lit up as the Sun sets which confirms that the Earth has a curved surface.
- › **Equal Pull of Gravity**– Objects weigh about the same no matter where they are on Earth. This means the force of gravity is the same everywhere, which means the Earth must be a sphere.
- › **Photos from Space**– Now we can actually observe the Earth from space and we can see that it is actually spherical. **NOTE: THIS IS THE BEST EVIDENCE WE HAVE !!!**
- › **Polaris**– The altitude of Polaris increases as you travel from the equator to the North Pole which is only possible if the surface is curved.

THE SHAPE OF THE EARTH

The Earth is not a perfect sphere, rather, it is an **oblate spheroid**, slightly flattened at the Poles and slightly bulging at the equator.



Keep in mind that this picture is greatly exaggerated. In fact, when you view the Earth from space it looks like a perfect sphere. The amount that it is oblate is so small that it is not noticeable. This in mind, the **best model** of the Earth would be something that is a perfect sphere, like a **ping-pong ball or a billiard ball**.

THE OUTER EARTH

The outer Earth is divided into three parts:

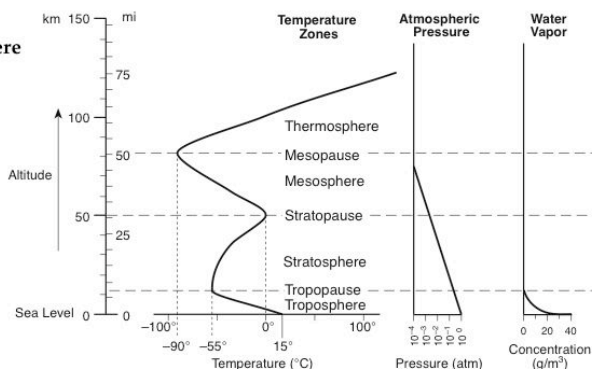
- › Lithosphere (the solid rocky crust of the Earth)
- › Hydrosphere (the liquid water on Earth)
- › Atmosphere (the shell of gases surrounding the Earth)

We can determine what elements make up each of the spheres by using this reference table, found on page 11:

Average Chemical Composition of Earth's Crust, Hydrosphere, and Troposphere

ELEMENT (symbol)	CRUST		HYDROSPHERE	TROPOSPHERE
	Percent by Mass	Percent by Volume	Percent by Volume	Percent by Volume
Oxygen (O)	46.40	94.04	33.0	21.0
Silicon (Si)	28.15	0.88		
Aluminum (Al)	8.23	0.48		
Iron (Fe)	5.63	0.49		
Calcium (Ca)	4.15	1.18		
Sodium (Na)	2.36	1.11		
Magnesium (Mg)	2.33	0.33		
Potassium (K)	2.09	1.42		
Nitrogen (N)				78.0
Hydrogen (H)			66.0	
Other	0.66	0.07	1.0	1.0

Selected Properties of Earth's Atmosphere



THE PROPERTIES OF THE ATMOSPHERE

Use this reference table on page 14 to determine the temperature, air pressure, or water vapor concentration at different altitude in the atmosphere. Notice that the names of the layers end in "sphere" and the names of the boundaries between the layers end in "pause." Be careful of units, particularly km and mi. on the vertical axis.

