

The Earth's curvature can be understood through the geometric principles of a sphere. The Earth is not a perfect sphere but is approximated as an oblate spheroid, which means it is slightly flattened at the poles and bulges at the equator. For our calculations and explanations, we often consider it as a sphere with a radius of approximately 6,371 kilometers (or about 3,959 miles).

To determine how far the Earth's curvature affects visibility or the distance to the horizon, we can use a basic formula that relates distance and height:

- **Distance to Horizon (D) = $\sqrt{2 \times \text{Height} \times \text{Radius}}$**

For example, if you are standing at a height of 1.8 meters (about 6 feet), the distance to the horizon would be calculated as follows:

- Radius of Earth (R) = 6,371,000 meters
- Height (H) = 1.8 meters
- Distance (D) = $\sqrt{1.8 \times 2 \times 6,371,000} \approx \sqrt{22,671,000} \approx 4,769$ meters, or about 4.77 kilometers (2.97 miles)

This means that from a height of 1.8 meters, you could see approximately 4.77 kilometers to the horizon before the curvature of the Earth obstructs your line of sight.

In summary, the curvature of the Earth impacts distances, particularly in navigation and visibility. This principle is crucial for various fields, including aviation, sailing, and geology, where understanding the layout of the Earth is essential.