6.1.3 Review the Geographic Coordinate System

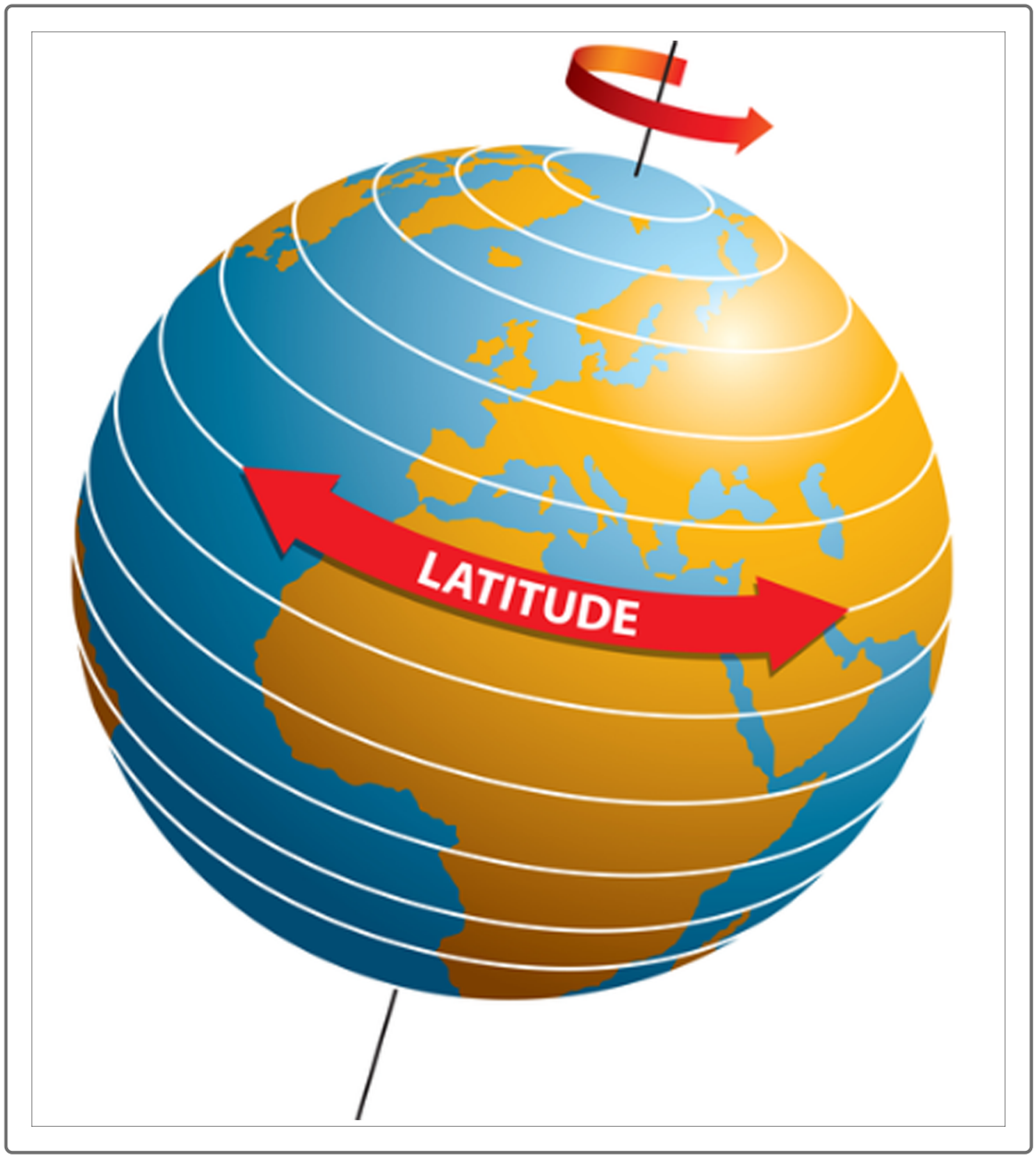
Your project planning document is prepared, approved, and pinned above your computer. You're ready to get going on the first step: creating a list of over 1,500 latitudes and longitudes.

But wait. Which one runs north to south? Latitude or longitude? And which one runs east to west? And how exactly do these work, again? As a professional in the world of data, you are no stranger to employing Google-fu when faced with a problem, so you decide to do a quick self-taught review.

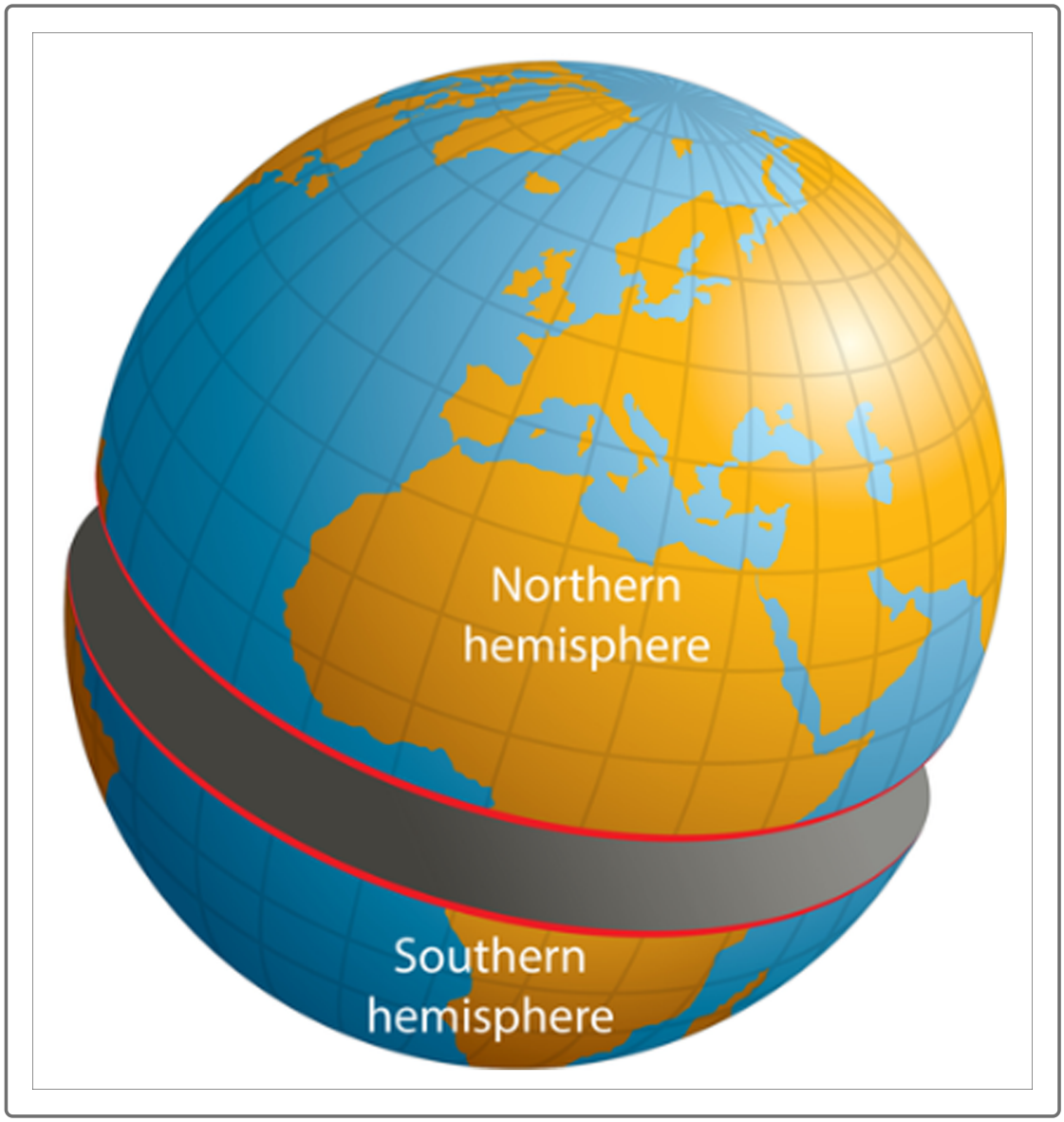
We use the **geographic coordinate system** (GCS) to reference any point on Earth by its latitude and longitude coordinates.

Latitudes are imaginary lines on Earth that run parallel east to west and are measured in angular units called degrees, minutes, and seconds, with 60 minutes in a degree and 60 seconds in a minute. Sometimes a latitude is referred to as a **parallel**. Consider, for example, the embattled 38th parallel (38° north) in East Asia that roughly demarcates North Korea and South Korea.

The **equator** is an imaginary line around the middle of the earth that is equidistant from the North and South Poles and has a latitude of 0°. The equator splits Earth into Northern and Southern Hemispheres.



All latitude lines above the equator are measured northward and considered positive, after 0° (the equator) and up to 90°, or 90° north (the North Pole). All latitude lines below the equator are measured southward and considered negative, before 0° (the equator) and down to −90°, or 90° south (the South Pole).



Longitudes are imaginary lines on Earth that run from the North to the South Poles and are called **meridians**. The **prime meridian** represents zero meridian, the origin for longitude coordinates, and splits Earth into the Eastern and Western Hemispheres.

The prime meridian passes through Greenwich, England, from which longitude east and west is measured.

All meridians east of the prime meridian are considered positive, after 0° and up to 180°. All meridians west of the prime meridian are considered negative, before 0° and down to −180°.

All together, the lines of latitude (parallels) and longitude (meridians) make up a geographic grid, as if the Earth were wrapped in graph paper with intersecting horizontal and vertical lines mapping to specific locations.

GCS makes it possible to pinpoint any place on Earth by providing its precise address, which is the intersection of its latitude and longitude lines.

Now, after having our refresher course on GCS, let's generate random latitudes and longitudes and retrieve the nearest city to those coordinates.