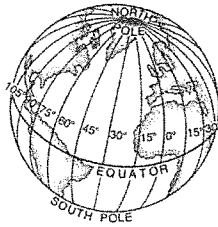


parallel to the **equator**, an imaginary circle that lies exactly half way between the North and the South Poles. Parallels measure **latitude**, or distance north and south of the equator. The equator is 0° latitude, the North Pole is 90° north latitude, and the South Pole is 90° south latitude. So any absolute location of a place on the surface of earth may be described in terms of longitude and latitude. For example, New York City is located at 74° west longitude and 41° north latitude.



Lines of Latitude. Meridians drawn between the North and South Poles measure longitude, a numbering system that calculates distance east and west of the prime meridian.

- **Relative location** – All places on earth also have relative locations – spots relative to other human and physical features on the landscape. In other words, where does the country of Chile lie relative to Brazil? or Argentina? Where does the Caspian Sea lie in relation to the Black Sea? or the Mediterranean Sea? Relative location is important to think about because it defines a place in terms of how central or isolated it is in relation to other places. For example, if you were to study a map of Central Asia in the 13th Century, you would find an important city called Samarkand that lay on a major trade route called the Silk Road that stretched out in both directions, making the city central to Eurasian trade. Once sea-based trade became faster and more efficient, the Silk Road trade withered away, leaving Samarkand a shrinking, isolated place, far from the center of commerce. So Samarkand's relative location changed, although its absolute location has stayed the same. Today modern cities wax and wane not only in size, but also in levels of prosperity and types of activities as their relative locations change.

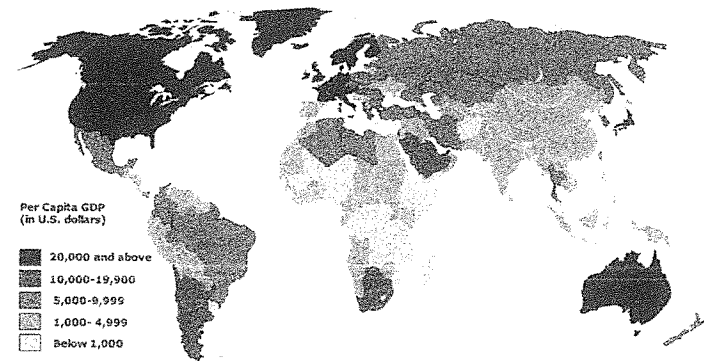
Use of Maps

Geographers use maps in two basic ways:

- **Reference material** – Maps are efficient tools for storing information. Once a map is drawn, it may be pulled out to help find relative locations of places. Maps show roads or waterways that connect places, and for centuries travelers have used them. For example, 16th century European explorers used maps to help them cross the Atlantic Ocean, just as 21st century Americans use maps to visit vacation destinations.
- **Communications/education** – Maps may also be used to explain spatial perspectives to others. These maps are often thematic because they are designed to explain a type of geographic information. Examples are maps that show soil types, relative elevations, economic prosperity levels, and spatial arrangements of racial and ethnic groups.



A Changed Relative Location. Although it was once one of the grandest cities in the world due to its location on the Silk Road, today Samarkand is only the third largest city in Uzbekistan.



Per Capita GDP. The map above is meant to communicate information about various economic prosperity levels of countries around the world. (Reference: International Monetary Fund, 2008 estimates)

Map Projections

An important problem with communicating information through maps is that the only accurate representation of earth is a globe. When spatial information is presented on a flat piece of paper, a cartographer immediately faces the issue of **distortion** caused by trying to represent a three-dimensional object (the earth) on a two-dimensional surface (a flat map). Different methods have been devised to increase accuracy, but it is impossible to avoid some type of distortion. Inaccuracies may take several