Something Round to Something Flat

The Ball State University Libraries’ GIS Research and Map Collection (GRMC) created a Web page tutorial on map projections that can be used for research, teaching, and learning. The tutorial provides examples of map projections using maps from the GRMC collection. The Digital Media Repository includes a collection of maps representing the azimuthal equidistant projection, and those digital maps may also be useful to enhance this lesson. Answers to this lesson can be found using the GRMC Web page tutorial and the DMR collection.

The earth is shaped like a ball. On a globe, the shapes and sizes of the earth’s geographic features are shown accurately. Globes, though, cannot be detailed enough to be useful and at the same time be small enough to be convenient. So people need flat maps. However, when map makers transfer information from a round globe to a flat map, distortions and other problems arise. Usually, true shape and size are affected. So map makers have to devise different methods for presenting the round earth on a flat map. These methods are called map projections.

What type of map projection was used to create the United Nations flag (shown here)? Azimuthal equidistant

Which map projection distorts the size of Greenland, making it appear larger than the continent of Africa? Mercator

Which projection is useful for mapping areas that have long east-west dimensions, such as the United States? Albers equal area conic

Which map projection was selected for use by the National Geographic Society in 1998 for its new world map? Winkel Tripel
Which map projection shows the earth within a circle but omits the enlarged polar areas? \textit{Van der Grinten}

Which map projection is best suited for mapping areas with a north-south orientation and was used by the U.S. Geological Survey in the 1950’s for topographic maps, but is now nearly obsolete? \textit{Polyconic}

Which projection was used to make aeronautical charts and the U.S. Geological Survey 7.5-minute quadrangle topographic maps because shapes and directions are accurate? \textit{Lambert conformal conic}

Which ancient map projection is most useful for maps of polar regions for navigation purposes? \textit{Stereographic}

Why would the Robinson projection not be as useful to a navigator as the Mercator projection? \textit{The lines of longitude on the Robinson projection are not straight, making navigation difficult.}

Which map projection was used by Ptolemy in 150 A.D.? \textit{Equidistant (simple) conic}

Using the Digital Media Repository \textit{World Map Projections} collection—specifically the map centered on Dakar, Senegal, answer the following questions:

What two South American cities are about equidistant from Dakar, Senegal to Capetown, South Africa? \textit{Buenos Aires and Bogota}

What is the approximate equidistance (flight distance) from Dakar, Senegal to Vancouver, British Columbia, Canada? \textit{6,000 miles}

Which is closer in equidistance to Dakar, Senegal—the South Pole or Tokyo, Japan? \textit{The South Pole}

What African city is closest to the same equidistance between Dakar, Senegal and London, England and Berlin, Germany? \textit{Cairo, Egypt}
Which is closer in equidistance to Dakar, Senegal—Mexico City, Mexico or Bombay (now Mumbai), India? **Mexico City**

Which is closer in equidistance to Dakar, Senegal—Sydney, Australia or the North Pole? **The North Pole**