

Map Projections

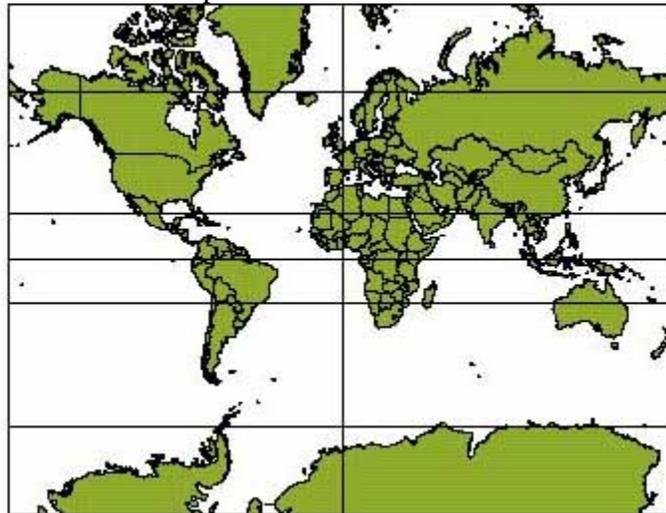
It is impossible to accurately represent the spherical surface of the earth on a flat piece of paper. While a globe can represent the planet accurately, a globe large enough to display most features of the earth at a usable scale would be too large to be useful, so we use maps. Also imagine peeling an orange and pressing the orange peel flat on a table - the peel would crack and break as it was flattened because it can't easily transform from a sphere to a plane. The same is true for the surface of the earth and that's why we use map projections.

The term map projection can be thought of literally as a projection. If we were to place a light bulb inside a translucent (clear) globe and project the image onto a wall - we'd have a map projection. However, instead of projecting a light, cartographers (map makers) use mathematical formulas to create projections.

Depending on the purpose of a map, the cartographer will attempt to eliminate distortion in one or several aspects of the map. Remember that not all aspects can be accurate so the map maker must choose which distortions are less important than the others. The map maker may also choose to allow a little distortion in all four of these aspects to produce the right type of map.

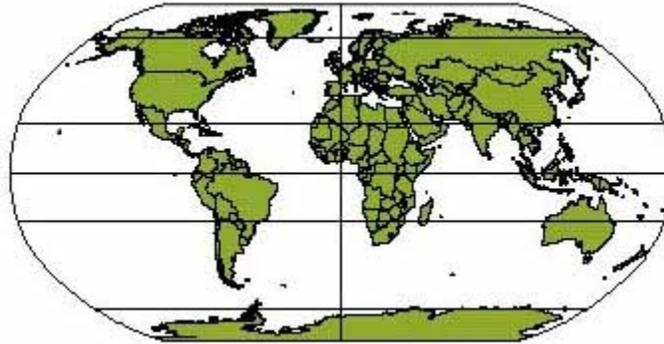
- **Conformality** - the shapes of places are accurate
- **Distance** - measured distances are accurate
- **Area/Equivalence** - the areas represented on the map are proportional to their area on the earth
- **Direction** - angles of direction are portrayed accurately

A very famous projection is the Mercator Map.

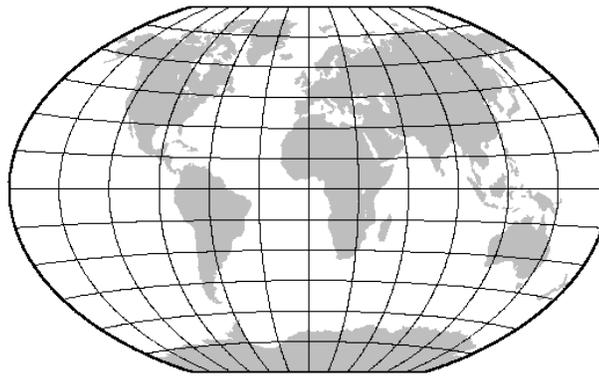


Gerardus Mercator invented his famous projection in 1596 as an aid to navigators. On his map, lines of latitude and longitude intersect at right angles and thus the direction of travel - the rhumb line - is consistent. The distortion of the Mercator Map increases as you move north and south from the equator. On Mercator's map Antarctica appears to be a huge continent that wraps around the earth and Greenland appears to be just as large as South America although Greenland is merely one-eighth the size of South America. Mercator never intended his map to be used for purposes other than navigation although it became one of the most popular world map projections.

For most of the 20th century, the National Geographic Society, various atlases, and classroom wall cartographers used the Mercator projection for most world maps. However, in the 1980s, the Society and many other cartographers switched to the Robinson Projection. The Robinson Projection is a projection that purposely makes various aspects of the map slightly distorted to produce an attractive world map.



However, the National Geographic Society recently made another small change and switched to the compromise Winkel Tripel projection.



Source: <http://geography.about.com/library/weekly/aa031599.htm>

Reviewing the Reading

1. Of the types of maps described in the article, which do you think is the best for general study?
2. Based on the article and pictures, which map projection have we used most this year?
3. Why is it impossible to create an accurate map of the world?