1.1
Introduction to Maps

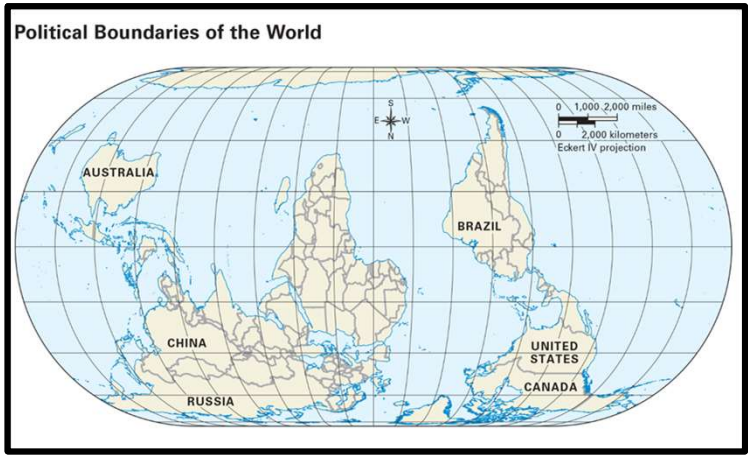
Objective and Essential Learning

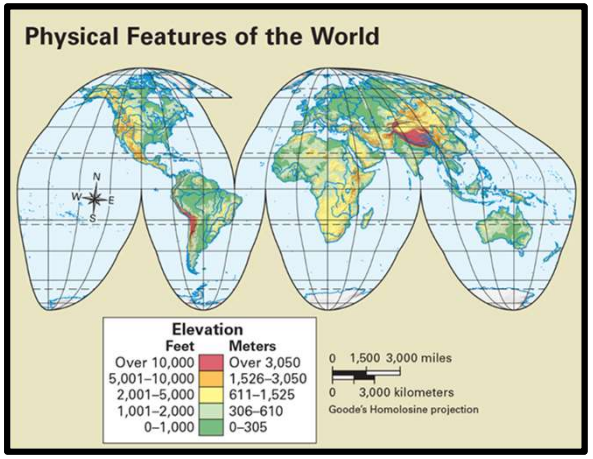
1.1 Identify types of maps, the types of information presented in maps, and different kinds of spatial patterns and relationships portrayed in maps.

- **1.1.1 Types of maps include reference maps and thematic maps.**
- 1.1.2 Types of spatial patterns represented on maps include absolute and relative distance and direction, clustering, dispersal, and elevation.
- 1.1.3 All maps are selective in information; map projections inevitably distort spatial relationships in shape, area, distance, and direction.

1.1.1 Types of Maps

1. Reference Maps - general information/navigation/location
   a. Political - states/countries/capitals
   b. Physical- natural features
   c. Road- highways, streets, etc.





1.1.1 Types of Maps

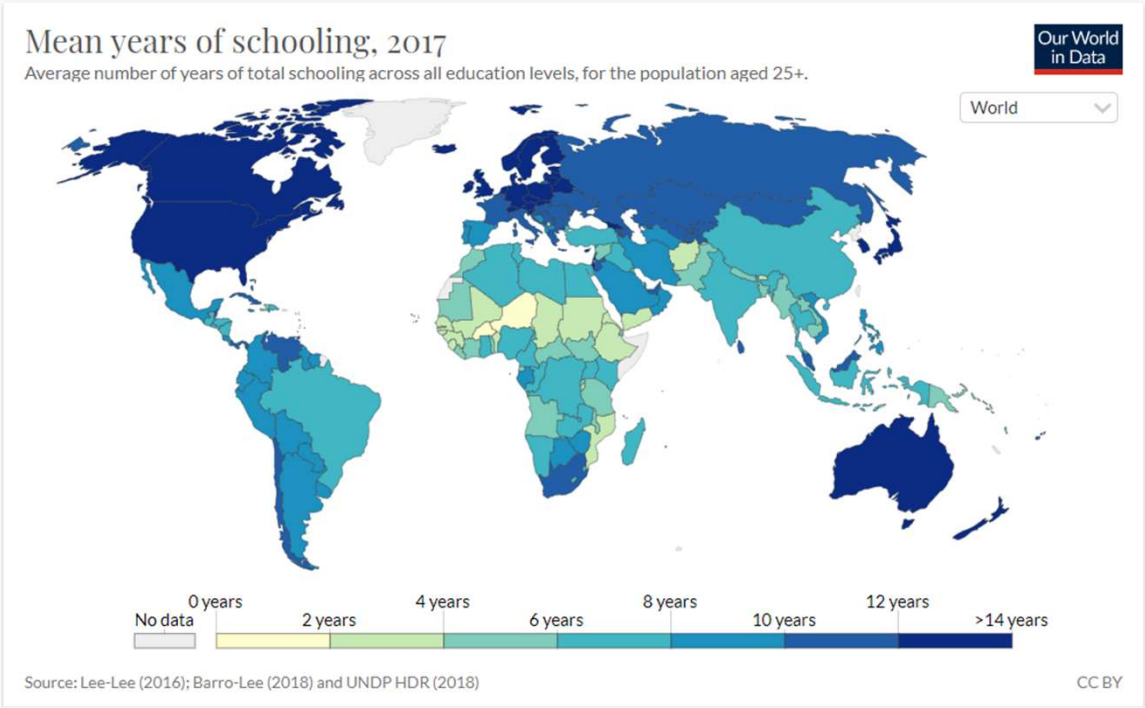
2. Thematic Maps- communicate information about a place - spatial aspects - what is it like there?

a. Choropleth
b. Dot-Density
c. Graduated/Proportional Symbol
d. Cartogram
e. Isoline & Topographic

1.1.1 Types of Maps

Choropleth Maps

Use various colors, shades of one color, or patterns to show the location and distribution of spatial data.



1.1.1 Types of Maps

Dot-Density

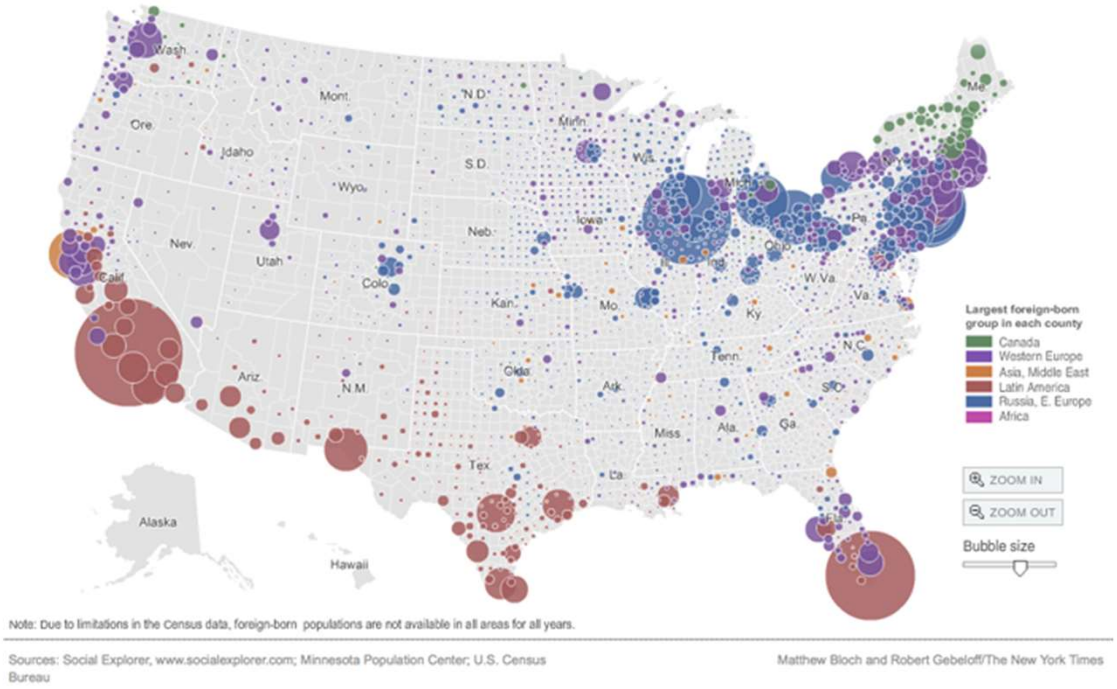
Each dot represents a specified quantity of a spatial characteristic.

Gun Violence in Cincinnati, Ohio

1.1.1 Types of Maps

Graduated/ Proportional Symbol

Use symbols of different sizes to indicate different amounts of a variable.



1.1.1 Types of Maps

Cartogram

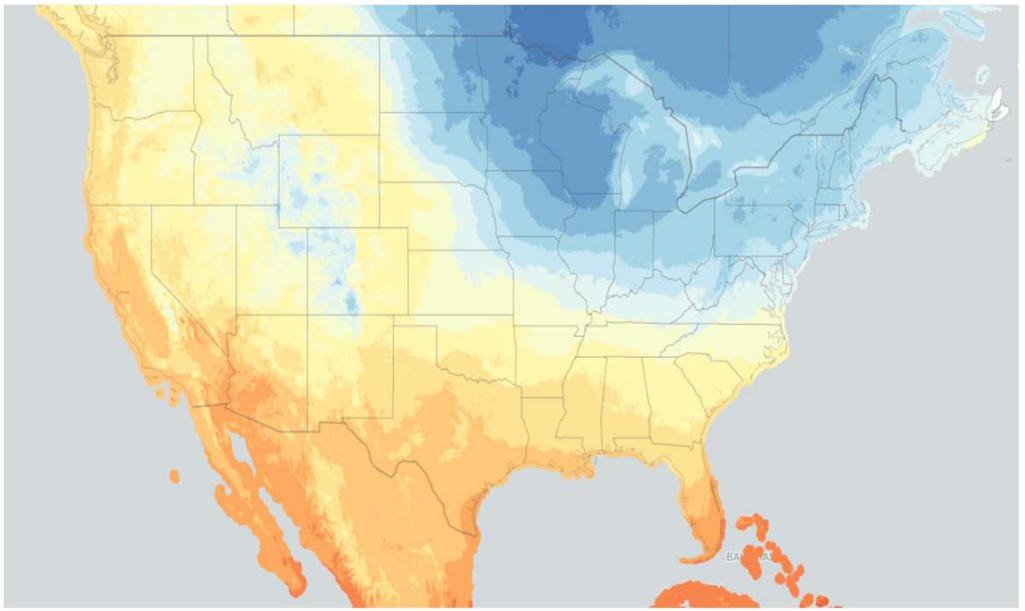
The sizes of countries are shown according to a specific variable. Area is distorted to show a variable.


World Population in 2018
The country's size in this map represents the size of the population.
Each square [▪] represents 500,000 people.
All 15,266 squares show where the world's 7.633 billion people live.
by Max Roser for OurWorldinData.org – the free online publication that presents the data and research on how the world is changing.
Population data from the UN Population Division.
Version 1 (September 2018).
Licensed under CC-BY-SA.
Our World in Data
Canada 37m
United States 326.8 million
4.3% of the world population
Mexico 130.8m
North America, Central America and the Caribbean in total 587 million
7.7% of the world population
Colombia 49.5m
Venezuela 32.4m
Ecuador 16.9m
Brazil 210.9m
2.8% of the world
Peru 32.6 million
Chile 18.2 million
Argentina 44.7m
South America total 428 million
5.6% of the world population
Europe in total 711 million
9.3% of the world population
United Kingdom 66.6 million
France 65.2m
Germany 82.3m
Poland 38.1m
Ukraine 44m
Italy 59.3m
Spain 46.4m
Russia 144 million
Asian part of Russia 34 million
Turkey 81.9m
Iran 82m
Iraq 39.3m
Uzbekistan 32.4m
Yemen 28.9m
Algeria 42m
Morocco 36.2m
Egypt 99.4m
Sudan 41.5m
Nigeria 195.9m
Ethiopia 107.5m
Uganda 44.3m
Kenya 51m
Tanzania 59.1m
D.R. Congo 84 million
Angola 30.8 million
Madagascar 26.3 million
Mozambique 30.5m
South Africa 57.4m
Africa in total 1.288 billion
16.9% of the world population
Pakistan 200.8m
Nepal 29.6m
India 1.354 billion
17.7% of the world population
China 1.415 billion
18.5% of the world population
South Korea 51.2m
Japan 127.2m
Bangladesh 166.4m
Myanmar 53.9m
Vietnam 96.5m
Thailand 69.2m
Philippines 106.5m
Malaysia 32m
Indonesia 266.8m
Java – 145 million the world's most populous island
Asia in total 4.568 billion
59.8% of the world population
Oceania in total 41 million
0.5% of the world population
Papua New Guinea 8.4m
Australia 24.8m
New Zealand 4.7m

1.1.1 Types of Maps

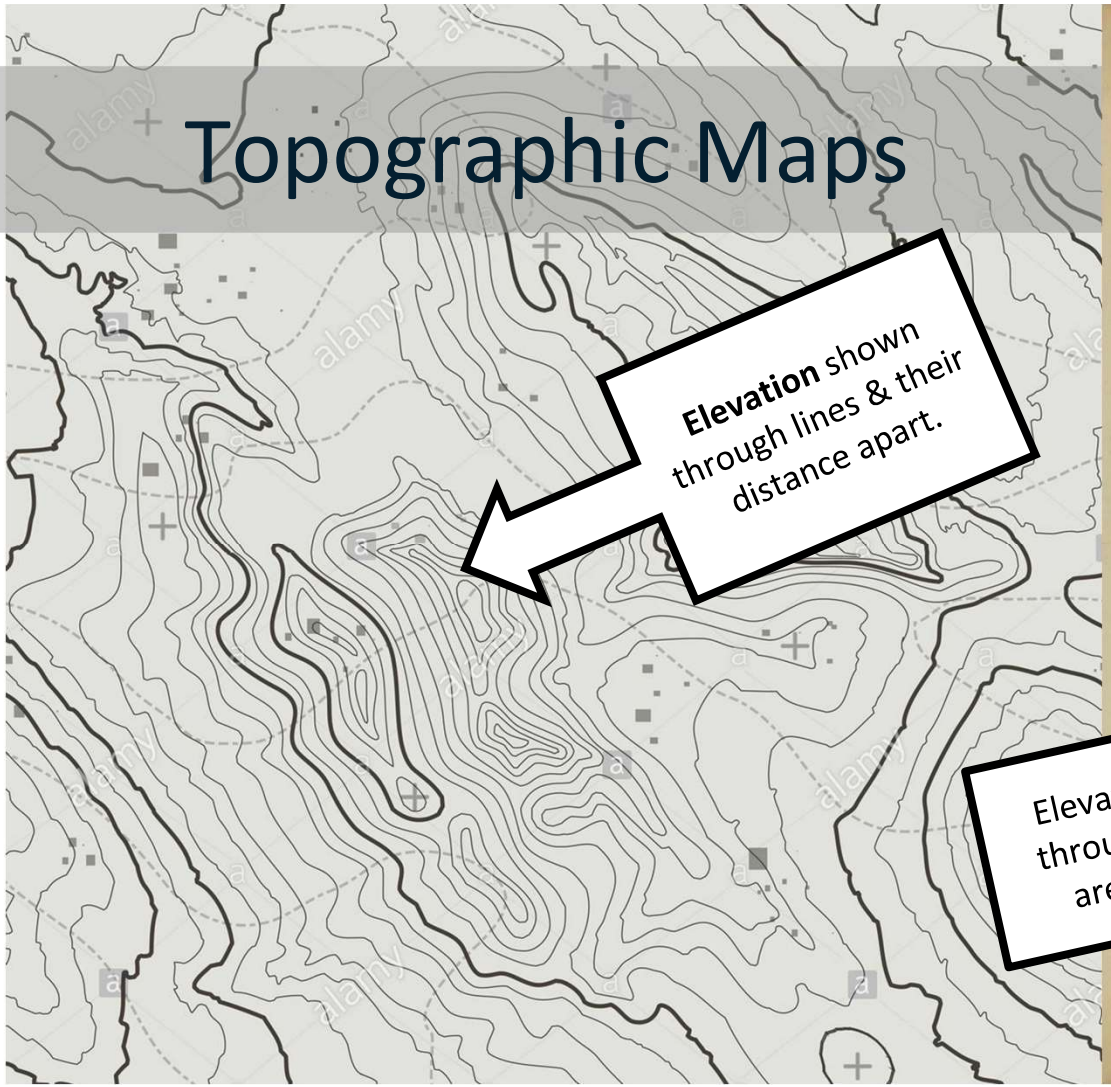
Isoline

Use lines that connect points of equal value to depict variations in the data across space. Used for weather and elevation.

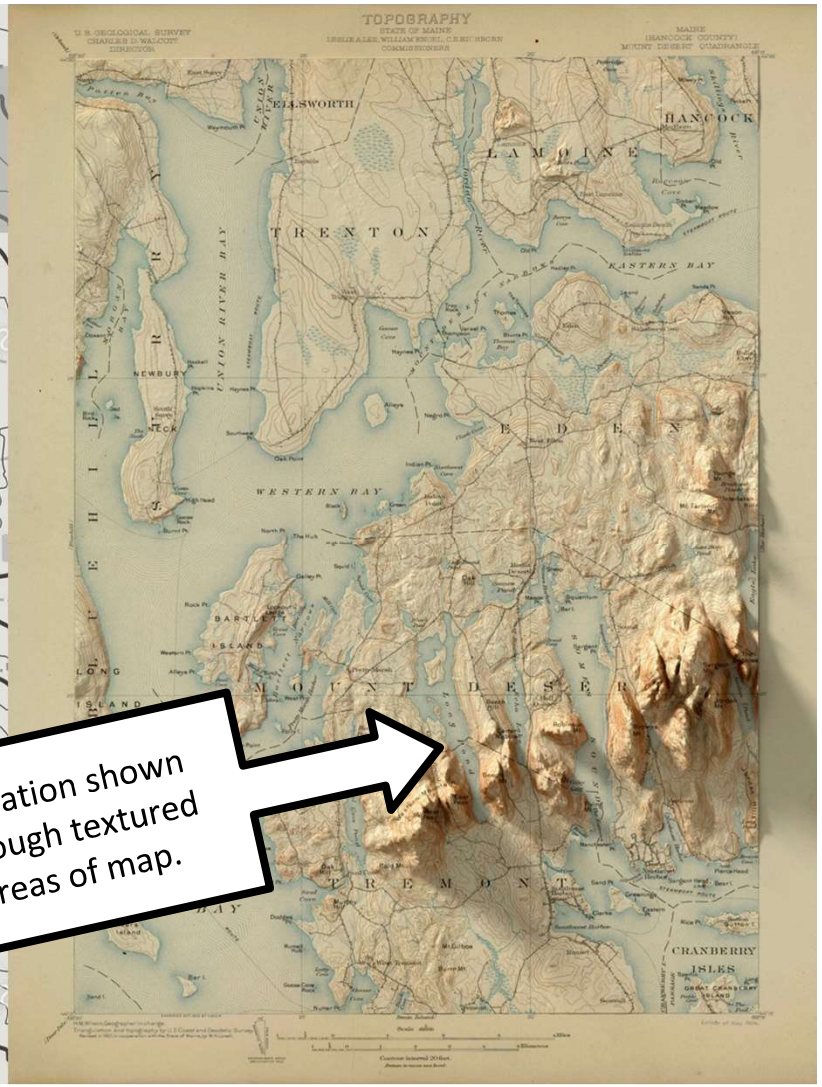


Temperature on January 31st, 2019

Topographic Maps



Elevation shown through lines & their distance apart.



Elevation shown through textured areas of map.

Objective and Essential Learning

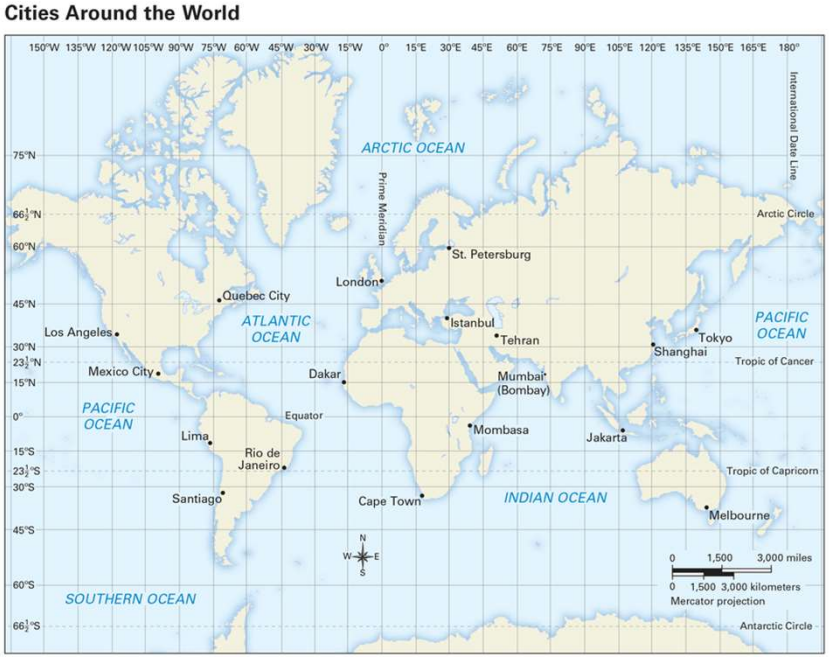
1.1 Identify types of maps, the types of information presented in maps, and different kinds of spatial patterns and relationships portrayed in maps.

- 1.1.1 Types of maps include reference maps and thematic maps.
- **1.1.2 Types of spatial patterns represented on maps include absolute and relative distance and direction, clustering, dispersal, and elevation.**
- 1.1.3 All maps are selective in information; map projections inevitably distort spatial relationships in shape, area, distance, and direction.

1.1.2 Types Spatial Patterns on Maps

1. Absolute Location
   - EXACT, PRECISE
   - Address
   - Latitude & Longitude
   - Rio de Janeiro is located at 23°S, 43°W.

2. Relative Location
   - Relationship to another place
   - Next to my house
   - Between Werk & Lawrence

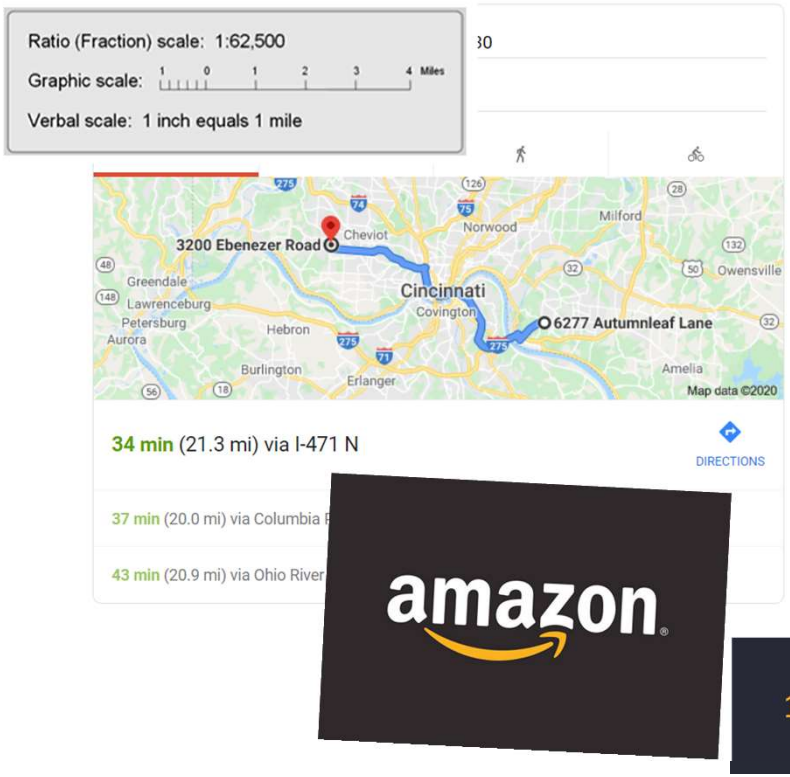


To find Rio, look for the parallel of latitude that is 23 degrees south of the equator. Move your finger along it until you come to the prime meridian. Now move west along the same line until you reach 43 degrees.

1.1.2 Types Spatial Patterns on Maps

3. Absolute Distance
   - EXACT, PRECISE
   - Miles/Kilometers/Feet
   - Oak Hills is 21.3 miles away from my house.
   - Map Scale

4. Relative Distance
   - Spatial Interaction: Connections, contacts, movement, and flow of things between places.
   - Amazon has drastically decreased relative distance between consumers and products.
     - I can order anything on Prime and have it delivered to my house in two days!

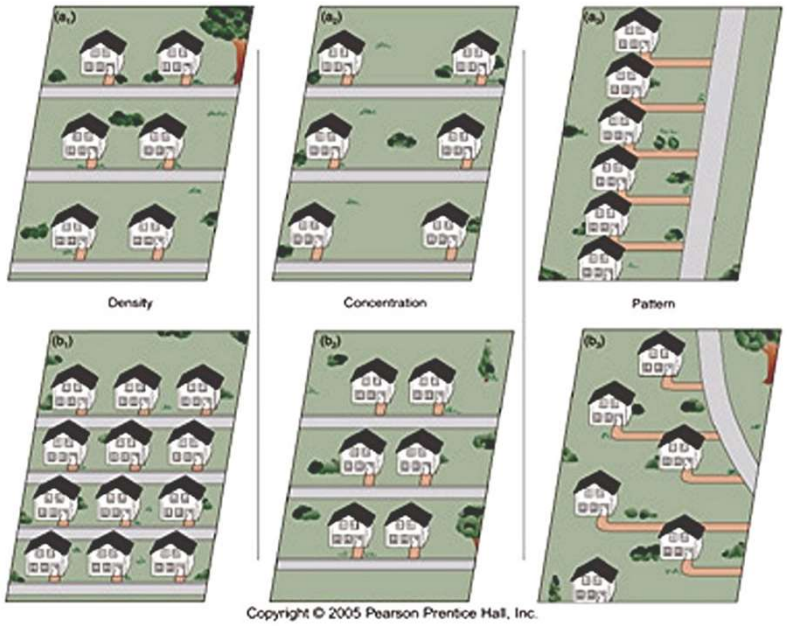


1.1.2 Types Spatial Patterns on Maps

5. Clustering
   - Close together
   - Density - The # of something in a defined area.

6. Dispersal/Distribution
   - Far apart
   - Distribution - The way something is spread out over an area.

7. Patterns & Spatial Associations
   - Indication that two (or more) phenomena may be related, associated, or correlated with one another.



Objective and Essential Learning

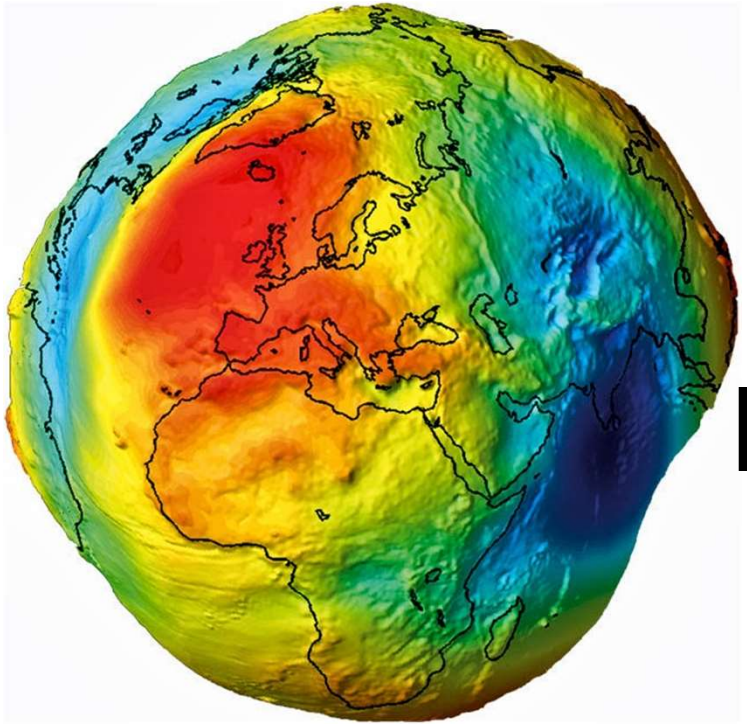
1.1 Identify types of maps, the types of information presented in maps, and different kinds of spatial patterns and relationships portrayed in maps.

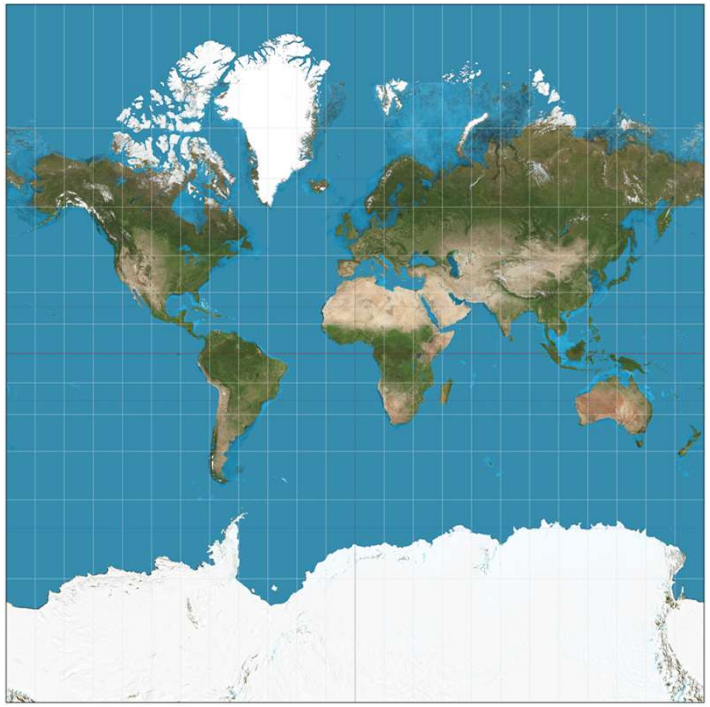
- 1.1.1 Types of maps include reference maps and thematic maps.
- 1.1.2 Types of spatial patterns represented on maps include absolute and relative distance and direction, clustering, dispersal, and elevation.
- **1.1.3 All maps are selective in information; map projections inevitably distort spatial relationships in shape, area, distance, and direction.**

1.1.3 Map Projections & Distortions

Map Projection: The process of a cartographer (map maker) showing the curved surface of the earth on a flat surface (map).

1.1.3 Map Projections & Distortions





1.1.3 Map Projections & Distortions

Map projections are...S.A.D.D, because they distort

S- Shape

A-Area

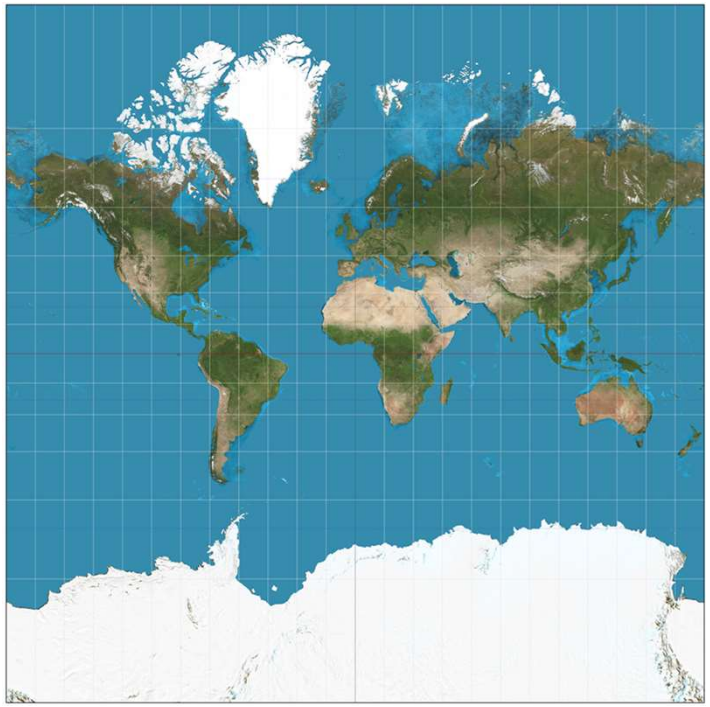
D- Distance

D- Direction

1.1.3 Map Projections & Distortions

Mercator (1569)

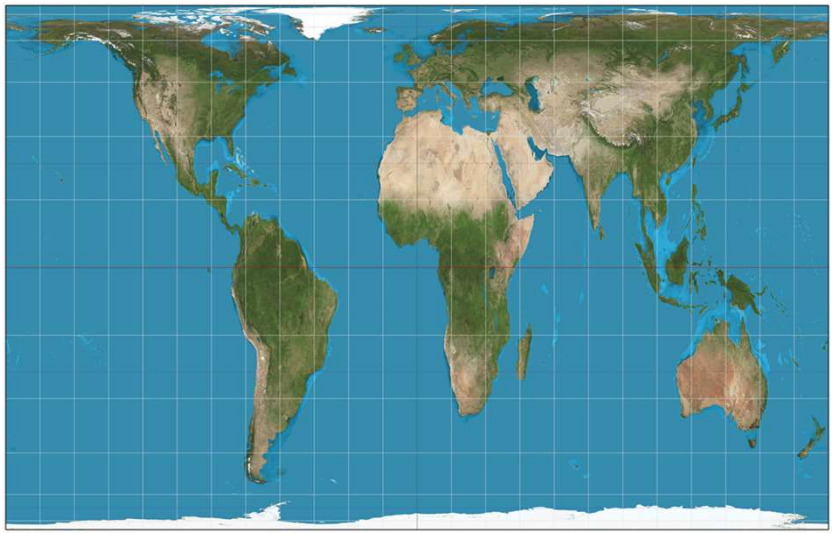
Advantages	Disadvantages
❑ Direction ❑ Shape ❑ Purpose: Navigation ❑ Preserves right angles of latitude and longitude.	❑ Area distorted near the poles ❑ Increases size of high latitude areas.

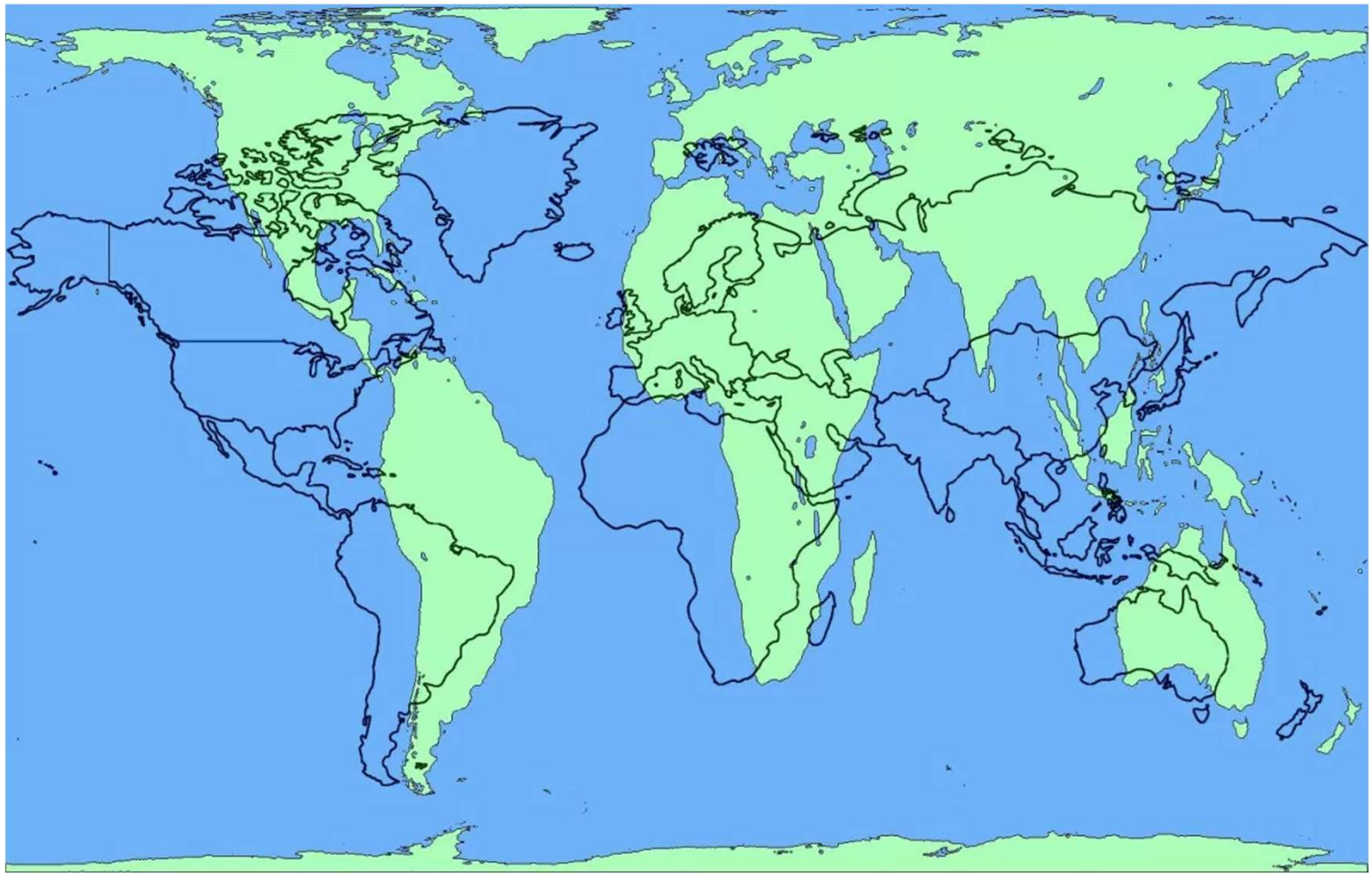


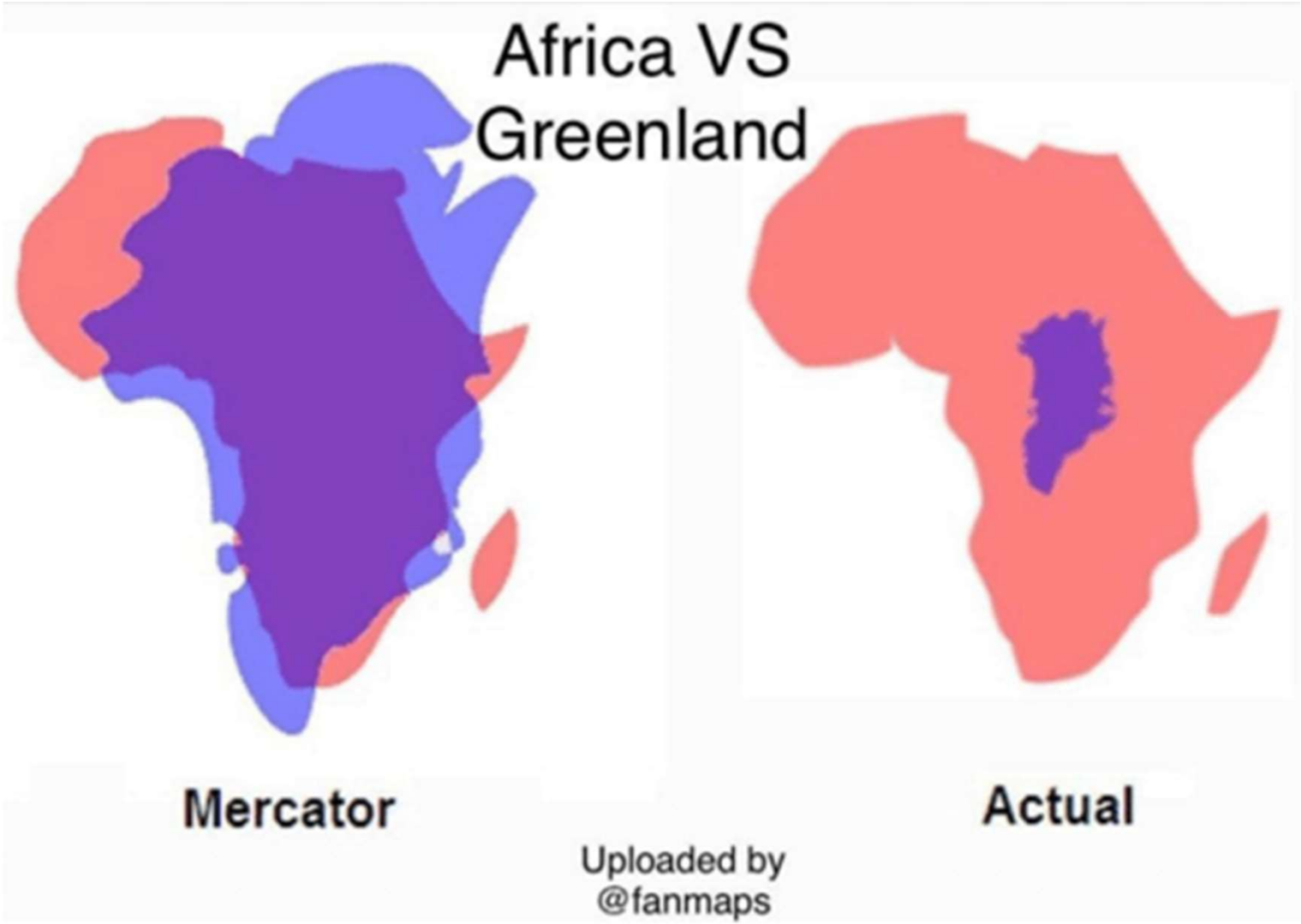
1.1.3 Map Projections & Distortions

Peters Equal Area

Advantages	Disadvantages
❑ Area of landmassess are accurate. ❑ Repositions many countries to their rightful size.	❑ Shapes are inaccurate near the poles. ❑ Vertically stretched near the equator.



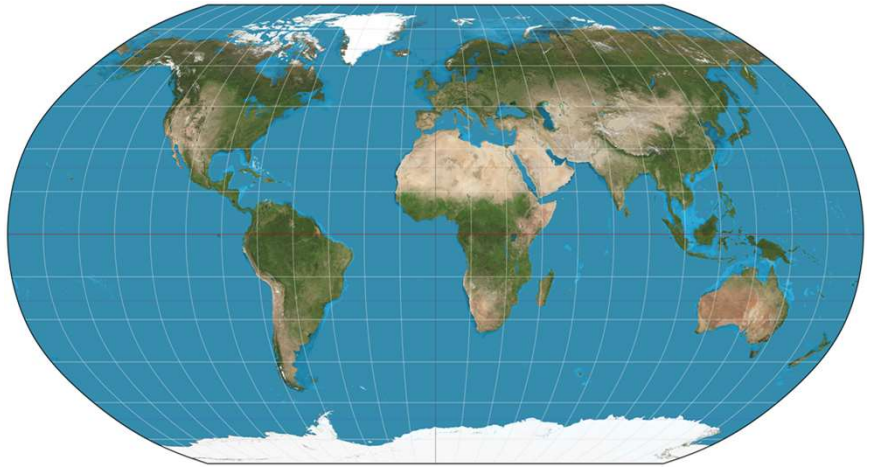



Africa VS
Greenland
Mercator
Actual
Uploaded by
@fanmaps

1.1.3 Map Projections & Distortions

Robinson

Advantages	Disadvantages
❑ No major distortions ❑ Purpose-Compromise	❑ All aspects are slightly distorted.



1.1.3 Map Projections & Distortions

Others - Conic, Azimuthal, Fuller