

Reading Maps and Globes

By Encyclopaedia Britannica, adapted by Newsela staff on 08.30.17

Word Count **1,721**

Level **1090L**



A globe is a three-dimensional representation of the Earth. Even a globe, however, cannot perfectly represent all the complexities of the people and places on our planet. Photo: Pixabay

Perhaps you have watched someone draw directions to their house on a napkin. Or maybe you like to watch as a map moves and changes on a smartphone as you ride in a car. Whether they are on paper or are digital, maps are an important part of everyday life.

A map is a pictorial representation of a large area. It could be of Earth's surface, the night sky, or the ocean. Whatever it is, maps give us an idea of our place in the world.

They once thought the world was flat

Usually a map is shown in two dimensions. In other words, it is drawn on a flat surface. Because world maps are drawn on a flat surface, they cannot show Earth's curved surface without significant distortions of how things really are.

Globes help to solve that problem. A globe shows the planet as a sphere. It is usually mounted on an axle that allows for rotation. A globe can show a planet with less distortion because of its rounded shape. However, Earth—like most other planets—is not a perfect sphere, but bulges a bit at the equator.

Maps and globes are tools for planning trips, learning about faraway places, and studying movements of people, goods and information. Maps can be misleading, however; their crisp lines, bright colors and labels might not always represent the truth. In reality, all maps and globes have some distortions and simplifications associated with the intended use of the map.

Reading a map or globe

Map styles and symbols vary across cultures, but most published maps share details in common. Maps should show a date of publication so people know it is still accurate.

Maps should also include place names, a scale (to compare sizes), and a guide to symbols (called a key or legend). There should be an arrow pointing north or a compass rose (showing the four cardinal directions: north, south, east, west).

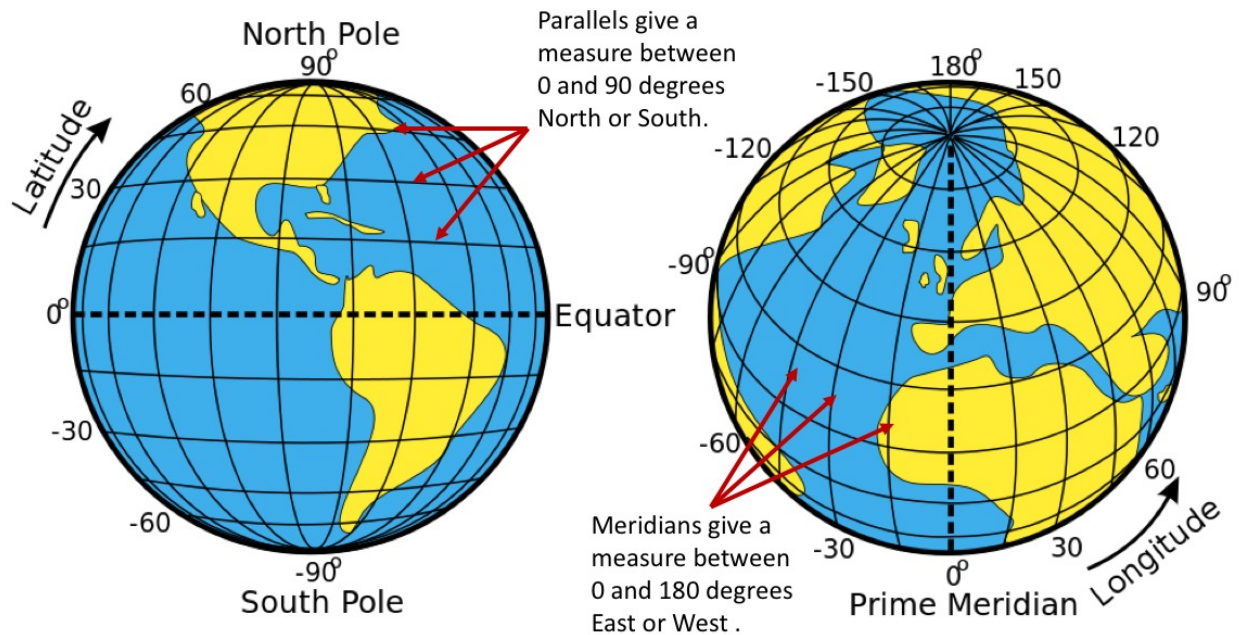
Intuitive searches and basic grids



One strategy for reading a map is to look first for familiar shapes or outlines, oceans and inlets, the arcs of mountains, or the blue swoops of rivers. It might be helpful to find a familiar city, road or other landmark. After getting a general overview of the map, more complex symbols and information can be explored.

Many paper maps have a grid. Basic map grids place letters across the top (A, B, C, etc.) and numbers on the side (1, 2, 3, etc.). Let's say you are looking at a map of your city and looking for a famous statue. The map may list that statue in the area "B4." You can trace down from the B and across from the 4 to find the statue.

Latitude and longitude



World maps show the latitude and longitude coordinates of Earth.

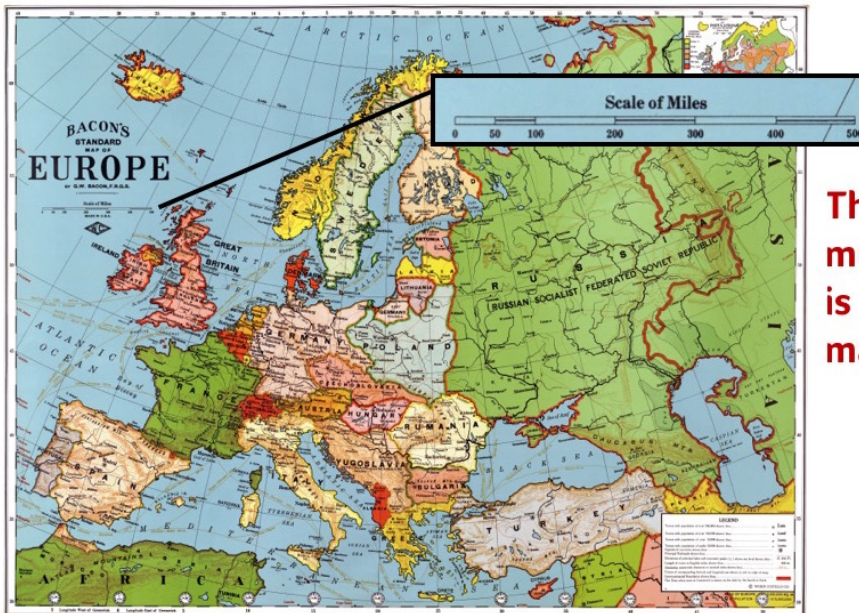
Lines of longitude, or meridians, are drawn from the North Pole to the South Pole. They show distances east or west from the prime meridian, which is at 0 degrees longitude and runs through the city of Greenwich, England.

Lines of latitude intersect meridians at right angles. These are also called parallels because they parallel the equator (0 degrees latitude), from which they measure north or south.

There are 360 degrees in a circle. Longitude measures to 180 degrees east or west ($180 + 180 = 360$) until arriving at a point in the mid-Pacific Ocean, on or near the International Date Line. That is the imaginary line running between the North Pole and the South Pole. It is also the point that distinguishes each calendar day from the next.

Latitude runs to the North Pole (90 degrees north) and the South Pole (90 degrees south). That adds up to 360 degrees if we see a globe in cross section ($90 + 90$ on one side, $90 + 90$ on the other).

Scale



A scale is a mathematical relationship between actual sizes and the sizes shown on a map. If 1 centimeter on the map equals 10 actual kilometers, the ratio can be written 1:1,000,000. That is because, there are 1 million centimeters in 10 kilometers. A map's scale can also be shown as a line marked with distances.

There is no perfect map scale. It is a compromise between two conflicting aims—the desire to show details, while also covering as much area as possible. Large-scale maps cover smaller areas, just as cameras with large zoom lenses provide close-ups. Small-scale maps show wider areas with less detail.

Map and globe orientation

People often assume that the top of a map should point north. However, map orientation is a choice, not a natural law. It is subject to political, economic, religious, and artistic desires. Muslim mapmakers, such as 12th-century geographer ash-Sharif al-Idrisi, often placed south at the top of their maps. Many medieval European maps were oriented toward the east, out of the belief that the Holy Land and the biblical Garden of Eden were the most important areas in the world.

Nothing is inherently wrong with a map topped by the South Pole, yet it seems odd to many people.

Video games and GPS (global positioning systems) in phones or in cars allow the user to change the way the map is oriented.

Map symbols



The key, or legend, tells what each symbol means.

Some map symbols are easily understood, but others require a legend – a key that explains the symbols. That is because symbols change depending on where you are. Native Americans, for example, once used cross-shapes to indicate stars. Spanish conquistadors used crosses to represent churches and towns.

On a typical map, black lines usually symbolize roads. Tick-marked lines are railroads, circles or stars are cities, and shading or dark lines are contours (lines that indicate how high up you are from sea level). Green and brown may shade real-world features (green forests, brown deserts).

Advantages of globes

Although globes are clunky and more expensive than maps, they show how the Earth is tilted (about 23.5 degrees) and how this relates to day lengths and the seasons. For example, when in a dark room, a person can shine a flashlight (representing the sun) on one side of a globe. This demonstrates how sunlight reaches half the tilted Earth while leaving the rest in shadow, according to the season. Globes also show shapes, sizes and lines with fewer distortions.

Types of terrestrial maps

The most popular maps are road maps, political maps (showing countries, states or counties), and physical maps (of mountains, rivers, etc.).

Thematic maps are also popular, focusing on one or two themes, such as how much money people make on average in an area. General reference maps include a mixture of information, as do many road, political and physical maps.

Transportation maps

Road maps blend political and physical information. GPS and Web-based aids such as Google Maps include these as basic maps. When these are too old, however, mistakes can occur. Green fields may appear where malls have been built, and streets might continue where they show up as dead ends.

As a GPS is moved, its satellite coordinates are beamed onto the base map. The screen shows a shifting, turning icon, which gives the illusion that the map is being created as you move.

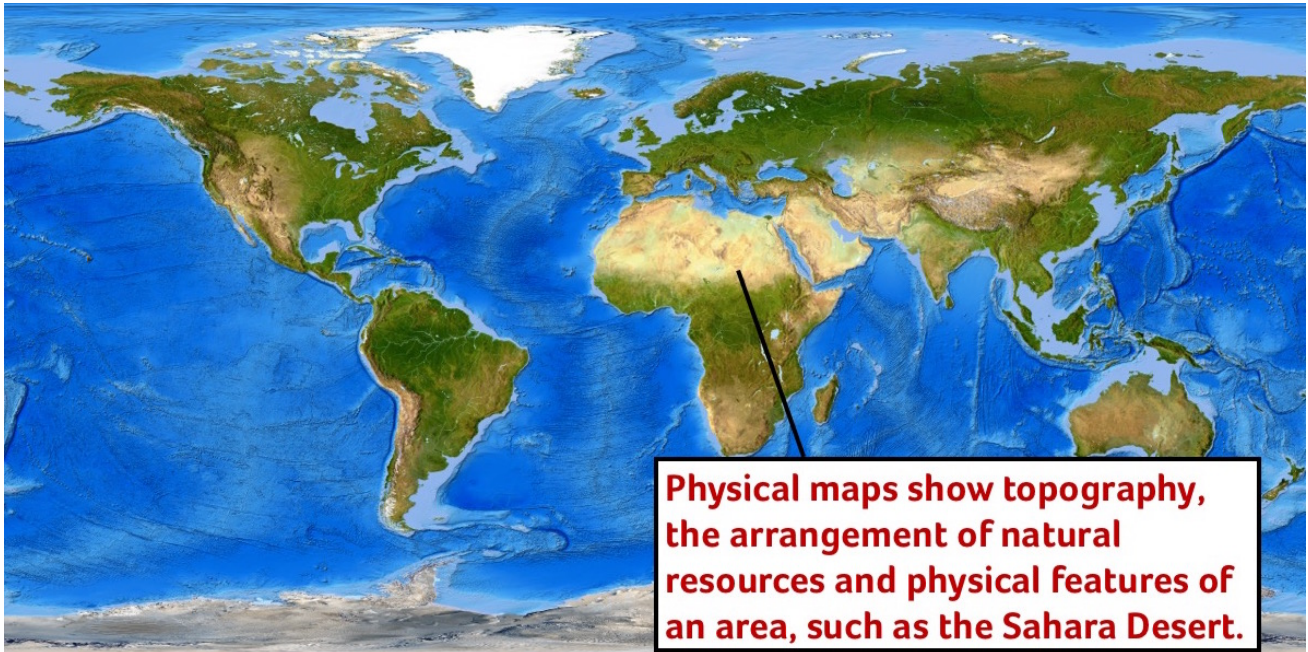
Political maps



Countries, provinces or states, cities and counties are the focus of political maps. Their bright colors and crisp borderlines encourage geographic literacy but are deceptively simple. They tell only partial truths about nations and borders. These maps do not show, for example, that

many borders are not even lined by walls or fences. Moreover, they eventually change as countries disappear (such as the Soviet Union), are renamed (such as when Burma became Myanmar), or reunify (as East and West Germany did in 1990).

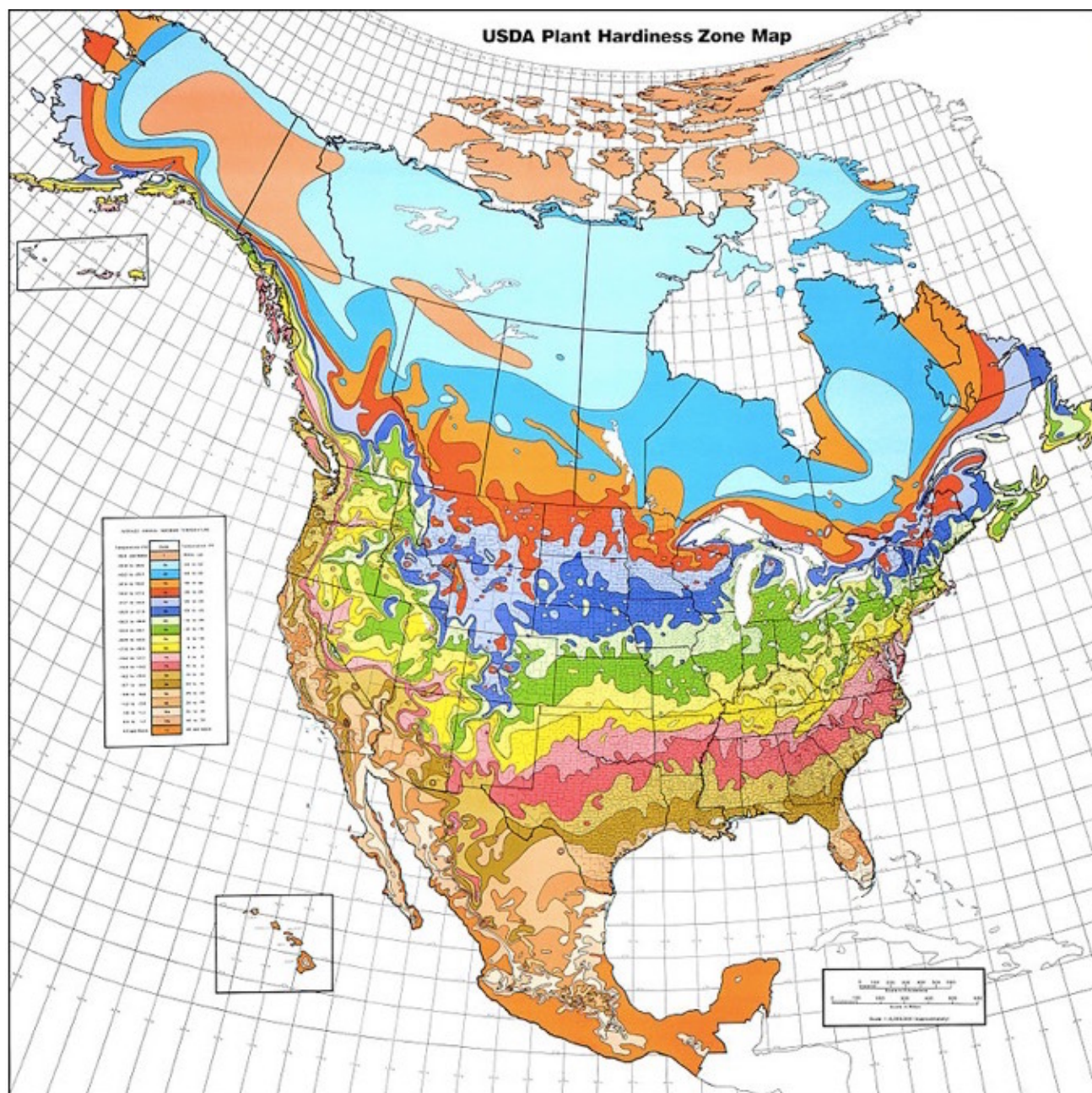
Physical maps



Rivers, lakes, mountains, hills, deserts and other natural features are on physical maps. Topographic maps show the relief, or shape of mountains, with dark shading or short lines showing how steep they are. Some show elevations with contours, lines of progressively greater height, such as 50, 60 and 70 feet. Contours drawn close together indicate steeper slopes (called grades, or gradients).

Older maps depict highlands with sketches of snowcapped peaks rather than with detailed sketches of mountains and plateaus. Some maps and globes are made with raised bumps along mountain ranges.

Thematic maps

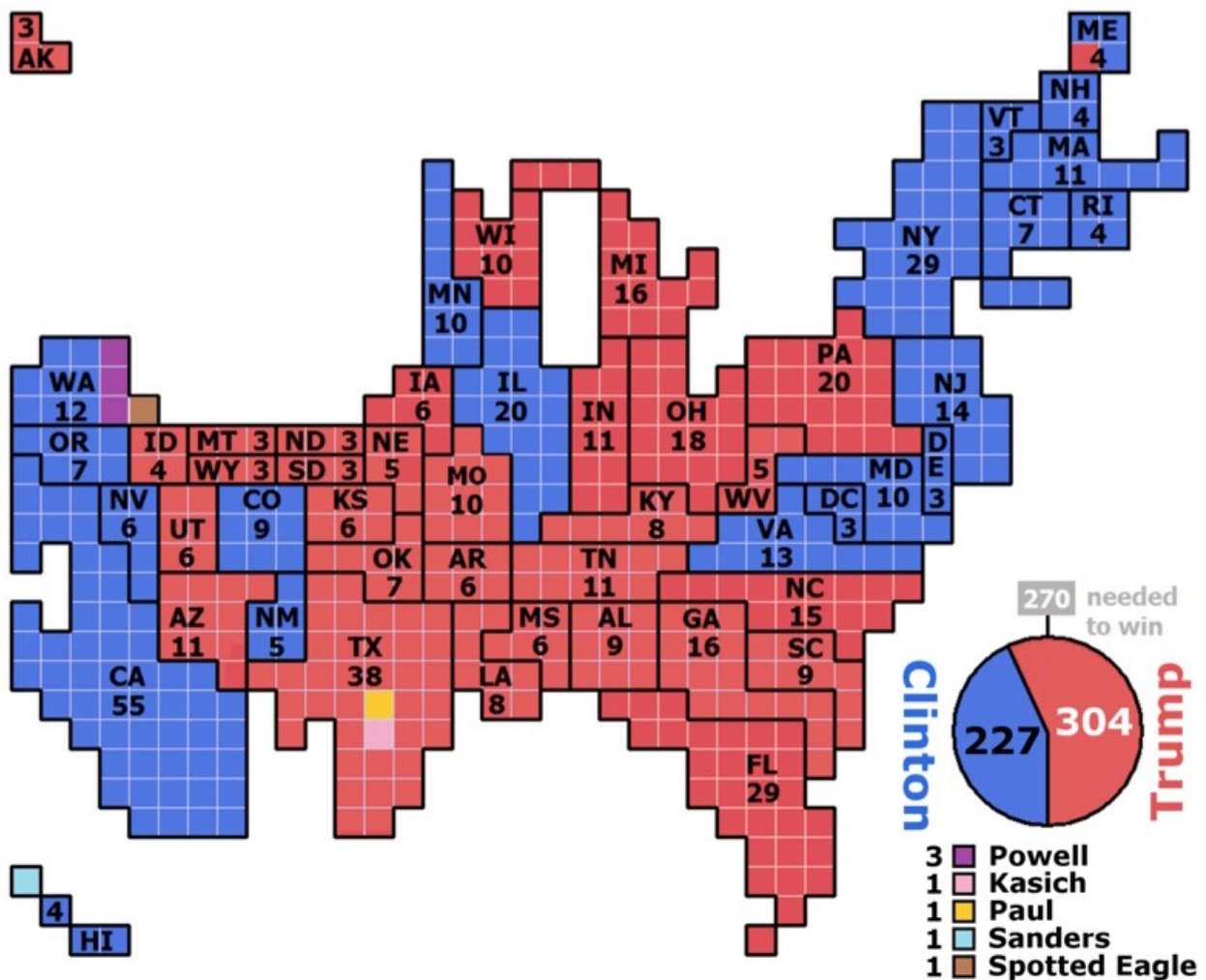


If a map focuses on the symbolic display of data such as a country's population, it is called a thematic map. These maps might focus on language, religion, income, population, or any other kind of measurable data. Some show processes such as toxic waste spills, earthquakes, or the geologic history of continental drift.

The most common types use shading, line patterns, or dots to indicate different measures. Flow maps often use arrows to indicate change or movement.

Thematic maps can be misleading because they hide certain statistics. A presidential election map, for instance, might shade a state red if 50.1 percent of its voters elect a Republican lawmaker. It might then be called a "red state." However, this ignores nearly half the population that did not vote to elect a lawmaker from that political party.

Cartograms



Another way of showing information about different locations is the cartogram. These involve more artwork than normal maps. They freely distort shapes, directions and areas beyond normal ranges to illustrate or explain statistics. A cartogram "weights" the sizes of states, provinces or countries to reflect information: a large number swells an area, while a small number shrinks it.

For example, a comparison of weapons exports by country would show a bloated United States because it ships out more weapons than any other country. A population cartogram would bloat the outlines of India and China, the two countries in the world with the most people.