3.1 Guided Notes

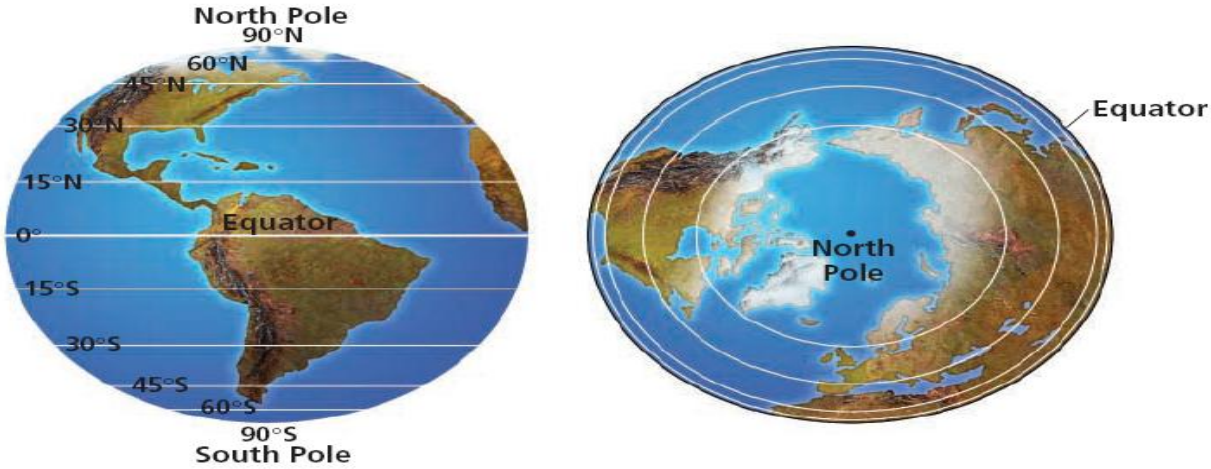
Objectives

- **Distinguish** between latitude and longitude.
- **Explain** how latitude and longitude can be used to locate places on Earth's surface.
- **Explain** how a magnetic compass can be used to find directions on Earth's surface.

Latitude

- The points at which Earth's axis of _____ intersects Earth's surface are used as reference points for defining direction. These points are the geographic North Pole and South Pole.
- Halfway between the poles, a circle called the _____ divides Earth into the North and Southern Hemispheres.
- A reference _____ that is made up of additional circles is used to locate places on Earth's surface.
- One set of circles describes positions north and south of the equator. These circles are known as _____, and they express latitude.
- **parallel** any circle that runs east and west around Earth and that is parallel to the equator; a line of _____
- **latitude** the angular distance north or south from the equator; expressed in _____

The diagram below shows Earth's parallels.



Degrees of Latitude

- Latitude is measured in degrees, and the equator is ___° latitude. The latitude of both the North Pole and the South Pole is _____°.
- In actual distance, 1° latitude equals about _____ km.

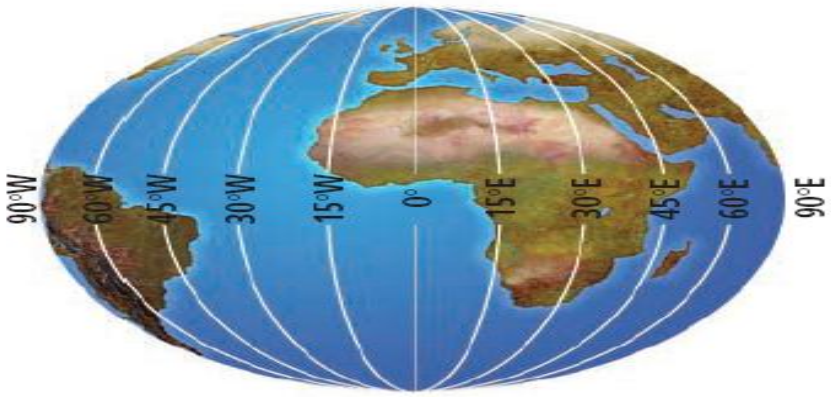
Minutes and Seconds

- Each degree of latitude consists of ____ equal parts, called *minutes*. One minute (symbol: °) of latitude equals 1.85 km.
- In turn, each minute is divided into 60 equal parts, called _____ (symbol: °).

Longitude

- East-west locations are established by using _____.
- **meridian** any semicircle that runs north and south around Earth from the geographic North Pole to the geographic South Pole; a line of _____
- **longitude** the angular distance east or west from the _____ meridian; expressed in degrees

The diagram below shows Earth's meridians.



Degrees of Longitude

- The meridian that passes through _____, _____ is called the *prime meridian*. This meridian represents 0° longitude.
- The meridian opposite the prime meridian, halfway around the world, is labeled 180°, and is called the *International* _____ _____.

Distance Between Meridians

- The distance covered by a degree of longitude depends on where the degree is measured. The distance measured by a degree of longitude decreases as you move from the - _____ toward the _____.

Great Circles

- A great circle is any circle that divides the globe into _____, or marks the circumference of the globe.
- Any circle formed by two _____ of longitude that are directly across the globe from each other is a great circle.
- The _____ is the only line of latitude that is a great circle.
- The route along a great circle is the shortest distance between two points on a _____. As a result, great circles are commonly used in _____, such as for air and sea routes.

The diagram below shows what a great circle is.

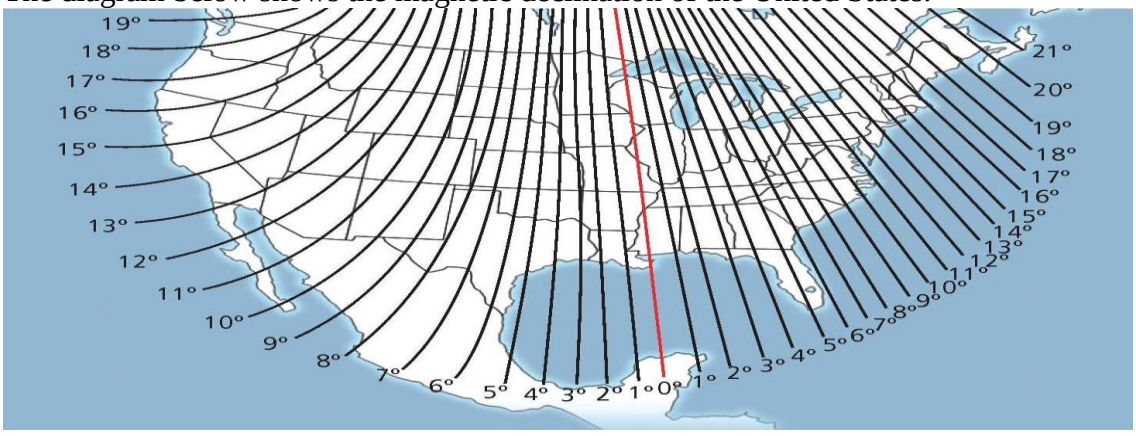
Finding Direction

- One way to find direction on Earth is to use a magnetic _____.
- A magnetic compass can indicate direction because Earth has magnetic properties as if a powerful bar-shaped magnet were buried at Earth's center at an angle to Earth's _____ of _____.
- The areas on Earth's surface just above where the poles of the imaginary magnet would be are called the _____ *poles*.
- The geomagnetic poles and the geographic poles are located in different places.

Magnetic Declination

- The angle between the direction of the _____ pole and the direction in which the compass needle points is called *magnetic declination*.
- In the _____ Hemisphere, magnetic declination is measured in degrees east or west of the geographic North Pole.
- Because Earth's magnetic field is constantly changing, the magnetic declinations of locations around the globe also change constantly.
- By using magnetic declination, a person can use a compass to determine geographic _____ for any place on Earth.

The diagram below shows the magnetic declination of the United States.



The Global Positioning System

- Another way people can find their location on Earth is by using the _____ _____ _____, or GPS.
- GPS is a satellite navigation system that is based on a global network of ____ satellites that transmit radio signals to Earth's surface.
- A GPS receiver held by a person on the ground receives signals from three satellites to calculate the _____, _____, and _____ of the receiver on Earth.