IR-4: Classroom Grid

IR-5: Latitude/Longitude Coordinates

Location	Latitude	Longitude
	35° N	139° E
	11° N	104° E
	1° N	103° E
	18° N	72° E
	59° N	30° E
	52° N	13° E
	48° N	2° E
	15° N	32° E
	6° N	3° E
	33° S	18° E
	4° N	74° W
	32° N	117° W
	49° N	123° W
	29° N	95° W
	40° N	73° W

Location	Latitude	Longitude
Tokyo, Japan	35° N	139° E
Phnom Penh, Cambodia	11° N	104° E
Singapore, Singapore	1° N	103° E
Mumbai, India	18° N	72° E
St. Petersburg, Russia	59° N	30° E
Berlin, Germany	52° N	13° E
Paris, France	48° N	2° E
Khartoum, Sudan	15° N	32° E
Lagos, Nigeria	6° N	3° E
Cape Town, South Africa	33° S	18° E
Bogotá, Colombia	4° N	74° W
Tijuana, Mexico	32° N	117° W
Vancouver, Canada	49° N	123° W
Houston, Texas, USA	29° N	95° W
New York City, New York, USA	40° N	73° W

K—Key Word	I—Information	M—Memory Clue
Map		
Latitude		
Equator		
Tropic of Cancer		
Tropic of Capricorn		
Longitude		
Prime Meridian		
International Date Line		
Hemisphere		

Tools of the Trade

Mathematicians use graphs, formulas, theorems, and calculators to help them analyze data and calculate answers. Scientists use beakers, balances, and thermometers to conduct their research. Historians use timelines. What specialized tools do geographers use to analyze and apply geographic data that lead to practical solutions?

What tools do geographers use to map places and measure distances?

Geographers use maps to locate places, analyze spatial relationships, and predict future trends. A **map** is a flat representation of Earth, or at least a portion of it. Maps can represent large or small areas, but most are foldable and portable. Maps can show an incredible amount of detail that other tools (globes, satellite, or space shuttle photographs) cannot illustrate, or they can show an overview of the entire world.

Grid lines and other imaginary lines should be included on almost every map because they are necessary tools that help the user identify specific locations on the map. For instance, when looking at a political map of the United States, latitude and longitude lines assist the user in finding specific cities, national parks, or other points of interest.

- Lines of **latitude** are imaginary horizontal lines, running east and west, parallel to the equator, that measure distances north and south of the equator.
- The **equator** is where the sun hits Earth most directly, and so it has a measurement of 0° N/S. As the air begins to warm, it rises. As the warm air rises away from Earth, it reaches an altitude where it begins to cool and level off.
- Once the air gets cold and dense enough, it falls back to Earth. The points at which this colder air descends are the **Tropic of Cancer** (23° N) and the Tropic of Capricorn (23° S).

Lines of latitude and longitude provide a grid system that human beings use to subdivide maps or globes to help better locate specific places.

- The **North Pole** at 90° N and the **South Pole** at 90° S are even farther away from the equator.
- Lines of **longitude** are imaginary vertical lines, running north and south, that measure distances east and west of the **prime meridian**, which is 0° E/W.
- The opposite side of Earth from the prime meridian is roughly the **international date line**, which measures 180° E/W.

In order to make the study of Earth more manageable, humans divide the planet using imaginary vertical and horizontal lines. A **hemisphere** is half of a sphere or object.

- When applied to our planet, the northern hemisphere is the part of Earth from the equator to the North Pole.
- The southern hemisphere is the region from the equator to the South Pole.
- The eastern hemisphere starts at the prime meridian and expands eastward to the international date line.
- The western hemisphere begins at the prime meridian and continues westward to the international date line.

Similar to a graph in a math class, Earth can be divided in half two different ways. If the equator is used, which two hemispheres are identified? If the prime meridian is used, which two hemispheres are identified? In which two hemispheres do you live?

Now think about how you would describe in which hemispheres you would find different cities. St. Louis, Missouri, would be in the northwestern hemisphere, whereas St. Petersburg, Russia, would be in the northeastern hemisphere. What would your description be for Cape Town, South Africa, or Jakarta, Indonesia?