

TO WHAT DEGREE?

RECOMMENDED GRADES: 4-8



TIME NEEDED: 30-45 MINUTES

Description

Students walk on lines of latitude and longitude on the map and compare these to lines on a globe. They then locate places using coordinates.

Learning Objectives

Students will:

- learn about map projection, latitude and longitude, and how to find coordinates

Materials

- Globe (inflatable or other)
- To What Degree? Cards
- Colored cones (32 total: 8 red, 8 yellow, 8 green, 8 blue)

Preparation

10 minutes

- Read over the activity, make adaptations for student grade level, and gather materials.
- Distribute colored cones and To What Degree? Cards.

Rules



Have students remove shoes before walking on the map.

DIRECTIONS

PART ONE: PROJECTION, LATITUDE AND LONGITUDE

Projection

1. Tell students that projection is the way a round Earth is shown on a flat map. There are many types of projections. Show examples if time allows.

TO WHAT DEGREE?

2. Using an inflatable globe, show Earth and point out the seven continents (Asia, Europe, Africa, North America, South America, Antarctica, Australia & Oceania). Hold the globe so that students are looking at Asia, first with the North Pole pointing straight to the ceiling. Then tilt the globe a little forward so that what students see on the globe reflects what they see on the giant map. Ask one student to help you by squeezing the air out of the globe. Adjust the vinyl so that the view of the flattened globe approximates what students see on the giant map.

Latitude

1. Tell students that latitude is a measurement of distance north or south from the Equator. Latitude on maps is represented by a series of parallel lines wrapping around the globe. Note that this map's latitude lines arc across the map, resembling the lines on a globe.
2. Ask students to line up along the yellow border at the bottom of the map. Ask one student to stand at the North Pole and another to stand at the Equator at 90° East (center-bottom of the map). Add one student to each line of latitude directly north and south of these two points to form a straight line. Ask students to hold hands. The student at the North Pole must stay rooted to the spot but may pivot. Direct students to begin walking west toward Europe, but to maintain the straight line.

- Ask: *What do you notice?*

[The person on the Equator has to walk more distance than someone farther north.]

[As marked on the map, these lines are the same distance apart from each other anywhere on the map. In fact they are referred to as parallels of latitude.]

3. Explain that the North Pole is 90° north latitude. The South Pole is located at 90° south latitude (sometimes noted as -90° latitude).

Longitude

1. Tell students that longitude is a measurement of distance east or west of the prime meridian.
2. Ask students to stand on the yellow border along the perimeter of the map. Ask each student to locate a line of longitude; they are the ones that converge at the North Pole. Start to walk toward the North Pole together.

- Ask: *What happens?*

[Students get closer and closer together. Unlike parallels of latitude, which are kind of like a sliced onion, longitude lines are known as meridians. They run all the way around Earth. Each and any line of longitude runs through both poles and cuts Earth in half.]

3. Explain that Earth is divided into 360° of longitude; 180° of longitude east of the prime meridian, and 180° west of it (sometimes noted with a minus sign). The distance between degrees of longitude is not constant. At the Equator, one degree of longitude is about 69 miles, the same as latitude. A few feet from the poles, they are mere inches apart.

Coordinates

1. Tell students that any place on the surface of Earth can be located by its coordinates, a notation of a location's latitude and longitude.

TO WHAT DEGREE?

Demonstration: Find a few famous locations in Asia using coordinates:

- Approximately 33° N, 44° E [Baghdad]
- Approximately 22° N, 114° E [Hong Kong]
- Approximately 14° N, 101° E [Bangkok]

PART TWO: TO WHAT DEGREE?

1. Divide the class into 4 teams—red, yellow, green, and blue—and instruct each team to line up on the yellow border behind their “Base Camp” (the colored circles in the corners of the map). As the game is a relay race, each team should have the same number of players. If a team is short a player, one player on that team will play twice.

Optional

Give each student a lanyard corresponding to the color of his or her team.

2. On the circle at each Base Camp, stack colored cones of the corresponding team color, one cone per player. Stack each team’s To What Degree? Cards—one per player—face down next to the colored circles at the Base Camps.
3. Tell students the object of the game is to be the first team to locate and mark each of the coordinates from the game cards. The teacher is the referee. Instruct the first player in line at each Base Camp to stand on his or her Base Camp and take one cone from the stack. The player on the circle is the “Explorer.”
4. Tell students that each Explorer must draw one card at the beginning of the game. On each card are coordinates to one location on the map. The Explorer must walk along printed lines of latitude and longitude on the map in search of these coordinates, being careful not to step off the line. If any Explorer steps off the line, he or she must return to Base Camp and begin again. If any two Explorers touch each other, they must both return to Base Camp and begin again.
5. Explain that once an Explorer locates their coordinates, they must mark the spot with a cone and place their card beneath the cone. The player then returns to Base Camp continuing to walk along the lines of latitude and longitude. They must tag the next teammate and rejoin their team members at the end of the line on the border. The teammate who has just been tagged steps into the colored circle, becomes the Explorer, and draws a card.
6. Explain that the winning team is the first to locate and mark all of its coordinates and return to the yellow border. Continue playing until all teams have finished.

Note: The game may be a little more difficult for Red Team and Green Team as their Base Camps are at the north end of the map. In addition, as the game progresses, many direct paths to coordinates may become blocked. Players may need to work harder to find a path to their coordinates through the maze of spots already marked.

Modification

Instead of marking the coordinates with a colored cone, each Explorer sits on the spot he or she has located. Later Explorers may not pass through that point but must find another route to their coordinates. The winning team is the first to find and sit on each of its locations. Continue playing until all teams have finished.