Where in the Classroom is _____?
Coordinate Plane and Mapping

Author	Kassandra Campos
Grade Level	6
Duration	1-2 class periods

National Standards	AZ Standards	Arizona Social Science Standards
GEOGRAPHY **Element 1: The World in Spatial Terms** 1. How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information	**MATHEMATICS** **The Number System** 6.NS.6.c Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane. **ELA** **Reading** **Range of Reading and Level of Text Complexity** 6.RI.10 By the end of the year, proficiently and independently read and comprehend informational texts and nonfiction in a text complexity range determined by qualitative and quantitative measures appropriate to grade 6.	**Geography** **The use of geographic representations and tools helps individuals understand their world.** 6.G.1.1 Use and construct maps, graphs, and other representations to explain relationships between locations of places and regions. Key concepts include major landforms and water bodies, countries, cities, ecosystems, climate, languages, religion, economic systems, governmental systems, population patterns, disease, trade routes, and settlement patterns.

SIOP Elements

Preparation Adapting content Linking to background **Linking to past learning** Strategies used	**Scaffolding** **Modeling** **Guided practice** **Independent practice** **Comprehensible input**	**Grouping Option** **Whole class** **Small groups** **Partners** Independent
Integrating Processes Reading Writing **Speaking** **Listening**	**Application** **Hands on** Meaningful Linked to objectives Promotes engagement	**Assessment** **Individual** Group **Written** Oral

Arizona English Language Proficiency Standards

Speaking and Writing

Standard 3: By the end of each language proficiency level, an English learner can speak and write about grade appropriate complex literary and informational texts and topics.

B-5: use examples of precise language and domain-specific vocabulary within informative texts.

Listening, Speaking, Reading, and Writing

ARIZONA GEOGRAPHIC ALLIANCE

Where in the Classroom is _____? Coordinate Plane and Mapping

Standard 6: By the end of each language proficiency level, an English learner can participate in grade appropriate oral and written exchanges of information, ideas, and analyses, responding to peer, audience, or reader comments and questions.
B-5: contribute relevant information and evidence to collaborative oral and written discussions.

Overview

The principles of reading or constructing a coordinate plane can also be applied to map reading in terms of lines of latitude and longitude. This understanding of mathematic and geography skills can be useful in the world outside of the classroom and show how mathematic concepts have real world applications.

Purpose

In this lesson students will learn how to find and position coordinates on a horizontal and vertical number line. They will then transfer this knowledge to locating places on a map using latitude and longitude.

Key Vocabulary

coordinate plane: a set of number lines that that cross in a right angle at zero.
axis: a number line on a coordinate plane
x-axis: the horizontal number line
y-axis: the vertical number line
coordinates: a set of numbers that identify the location of a point on a coordinate plane
latitude and longitude: a set of numbers that identify the location of a point on a map

Materials

- Classroom sized number line
- Colored pencils/markers
- Classroom Map Worksheet (English and Spanish)
- Classroom Map with Coordinates Exit Ticket (English and Spanish)
- Classroom Map with Coordinates Exit Ticket Answer Key
- Classroom Map Vocabulary Cards (English and Spanish on one card)
- Classroom Map Vocabulary Test (English and Spanish)
- Toys (school mascot, robot, etc.)
- World map http://geoalliance.asu.edu/sites/default/files/maps/World-at.pdf

Objectives

The student will be able to:

1. Find and position coordinates on a coordinate plane.
2. Create a map of the classroom using coordinates.
3. Locate places on a map using coordinates.

Procedures

Prior Knowledge: *Students should be able identify rational numbers and understand them as a point on a number line.*
Prior to the Lesson: *Classroom sized number lines should be laid out on the floor, perpendicular to each other, in order to create a visual of a coordinate plane.*

SESSION ONE

Engage:

1. Ask students what they notice about how their classroom has changed. Once the classroom sized number lines are identified, ask how they can share their place in the room using these number lines*?* **(Preparation: Linking to past learning)**
2. Have students quickly share their responses with a partner in order to help second language learners practice their responses. **(Integrating Process: Speaking)**
3. Call on 2-4 students to share their partners' responses in a whole group discussion. Record their ideas on the board. **(Grouping: Whole class)**
4. Inform students that today, they will learn how to find and position coordinates on a coordinate plane. Then they will apply this skill to mapping the classroom. **(Integrating Process: Listening)**

Explore:

5. Distribute the Classroom Map Worksheet (English or Spanish) to students depending on their needs.
6. Model how to use the worksheet by first finding the coordinates using the number line for the Teacher's Desk. Emphasize that the horizontal

plane (x) is done first. Then the vertical plane (y). Tell them that this is true for reading a map as well. First number in a world location will be latitude. The second number will be longitude.

7. Then, position the coordinates for the Teacher's Desk onto the Classroom Map Worksheet. Then, label the point *Teacher's Desk.* **(Scaffolding: Modeling; Application: Hands on)**
8. Ask students if there are any questions. Then, place the toy (robot, school mascot, etc.) on a coordinate.
9. Ask the students to work with their table group to determine the coordinates for the toy. Call on a group to volunteer to share their process in finding the coordinate of the toy. Add coordinate to map and label the spot *Toy L1*.
10. Tell students they will be working in partner groups to complete the worksheet. Then, have them begin to complete a map of the classroom. Move the toy to a new location, and have students label the new location as *Toy L2*. **(Grouping Option: Partners, Application: Hands on)**
11. Support students that are struggling to create the map by helping them identify one of the two coordinates and then allowing them to locate the second point or allow them to follow a successful group and see how they are identifying the coordinates and completing the worksheet. **(Scaffold: Guided practice)**

Explain:

12. Write these sentence starters on the board:
    - The coordinates for ____ are ____.
    - ____ is on the x-axis.
    - ____ is the y-axis.
    - The coordinate we need to find is ____.
13. Ask students what they noticed about creating the classroom map. Have students share their ideas with their partners by using the sentence starters to best support second language learners. **(Integrating Processes: Speaking, Reading) (Grouping: Partners, Whole class)**
14. Record student responses on the board near their previous responses. Students should identify that they needed two points in order to position the coordinate onto their map. They should also clarify that x is found first, then y.
15. As students are responding to things they noticed in the activity, project the vocabulary cards used in this lesson. Have students add these terms with arrows onto their own map. After each vocabulary word is introduce, post the corresponding vocabulary card onto the word wall or on the board. **(Scaffolding: Comprehensible input; Grouping: Whole class)**
16. Ask students what the difference is between coordinates that have the numbers in reverse order, for example: (1,2) and (2,1). Do these coordinates describe the same location? Give another example: What are the similarities and differences between (2,5) and (2,-5)? Students work in groups of 4 to answer these questions. Students should be able to use the classroom number lines to come to their conclusions. **(Grouping Option: Small group; Integrating Processes: Speaking)**

Elaborate:

16. Discuss student answers with the whole class. Building off of student responses, add to the map coordinates with symbols in each corresponding quadrant: (- , +), (+, +), (-, -), and (+, -). **(Grouping: Whole class; Scaffolding: Comprehensible input;)**
17. Challenge students to locate a point on the coordinate plane from each of the quadrants. **(Scaffold: Independent Practice)**
18. Call on 4 different students to position a coordinate on the teacher map.
19. Ask students where they could use this math principle outside of class. Have students share with their partners prior to whole class discussion to best support language learners. **(Integrating Process: Speaking)**
20. Close the lesson by making connections to latitude and longitude on a map of the world and demonstrate on the World map. http://geoalliance.asu.edu/sites/default/files/maps/World-at.pdf

SESSION TWO

Evaluate:

21. Have students complete the Classroom Map with Coordinates Exit Ticket and Vocabulary Test (English or Spanish) depending on their needs. **(Assessment: Written, Individual)**

Assessment

Mathematics and Geography

The Classroom Map Worksheet and the Classroom Map with Coordinates Exit Ticket can be graded for accuracy. Mastery will be considered a score of 75% or higher.

Mathematics, ELA, and Geography

The Vocabulary Test can be graded for language acquisition. Mastery will be considered a score of 80% or higher.

Extension

Extend the lesson by having each student decide on a country to visit and research the latitude and longitude of the country on an electronic device. Distribute a World map http://geoalliance.asu.edu/sites/default/files/maps/World-at.pdf to the students and have students share the latitude and longitude of their "mystery countries." Classmates will then find the locations on the World map and label the mystery countries.

Sources

National Governors Association Center for Best Practices & Council of Chief State School Officers. (2010). *Common Core State Standards for Mathematics.* Washington, DC: Author