

GIS: Elementary Speaking

“Me on the Map”

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Classroom sessions/ estimated time: 4 days or class periods
First day: Introduce, read story, and create personal maps
Second day: Discuss map grids and place on personal maps – relate to latitude and longitude on a globe and on various flat maps
Third day: Introduce cardinal directions and orientation of personal maps
Fourth day: Conduct the map layer activity

Grade Levels: K-3 (or 4); can be used with older grades but stress the fact that the book may seem immature but the message is the important information.

Purpose: The purpose of these activities is to introduce the basic concepts of creating a map, understanding map grids, introducing cardinal directions and introducing maps as layers of information [(data) to launch the idea of Geographic Information Systems (GIS)].

Geography Standards Addressed:

- 1: How to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective.
- 2: How to use mental maps to organize information about people, places, and environments in a spatial context.
- 3: How to analyze the spatial organization of people, places, and environments on Earth's surface.

Indiana Social Studies Academic Standards Addressed:

- 2.3.4: Identify places that are nearby or related to the local community.
- 3.3.1: Locate the United States, Indiana, and the local community.
- 4.3.1: Use latitude and longitude to locate places in Indiana and other parts of the world.
- 4.3.4: Locate Indiana on a map of the United States; indicate the state capital, major cities, and rivers in Indiana and be able to place these on a blank map of the state.

Objectives: Upon completion of this lesson/activity, students will be able to...

1. understand their place in their community, state, country, and world,
2. create a basic map,
3. understand map grids (latitude and longitude),
4. grasp the concept of layering used in GIS, and
5. locate where they are live on a map.

Materials Required:

- Book: *Me on the Map* by Joan Sweeney (ISBN: 0-517-70095-6)
- White paper (or grid paper)
- Colored pencils
- Globe
- Various maps: world, U.S., Indiana, community
- Tape measures
- Clear, plastic two-liter soda bottles with lids and the bottom cut off – **one per student** (or clear plastic cups) OR clear plastic cups
- Gummi Bears **or** Fisher-Price Little People (note pad in people shapes)
- Hershey Kisses **or** Monopoly houses
- Red licorice for streets
- Square, buttered pretzels with grids for town

- Clip-art graphic of the Indiana state flag
- Clip-art graphic of the USA flag
- Tooth picks
- Earth balloons or green and blue round balloons
- Card stock circle cut-outs for dividers
- County outlines (optional)

Procedures:

Day 1

1. Discuss with the students their concepts of maps. Read the book “Me on the Map” by Joan Sweeney. Have the students create a map of their “special” (discuss possibilities – bedrooms, backyard, patio...) place. Utilize the white paper (or grid paper) and colored pencils.
2. Make sure that the students include on the map: a title, the author (themselves), and the date. Model on a flip chart a personal map of your creation. Discuss that the map will be from a different perspective – bird’s eye view – as if you are flying over your space.

Day 2 – long session (or break into two days)

3. Introduce the students to the globe. Discuss the concepts of latitude and longitude (LONG – north to south). Review latitude and longitude on a globe and on the flat maps.
4. Review the previous day’s activities with creating the personal maps.
5. Take out the personal maps and create a grid system on the personal maps. Demonstrate on your model from the previous day. Utilize ABCD and 1234; one set runs across the top of the map and another set runs down the left-hand side of the map. Develop the grid in equal increments.
6. Discuss with the students that the map they created is not to scale (they did not measure their personal spaces exactly and transfer that information to a scaled-down model on the paper). How could they create a map reflecting accurate scale?
7. Distribute two grid papers to each student. Discuss the possible scale(s) of the grid paper. In small groups, the students will utilize one grid paper to measure a space on the school’s grounds (playground, field, outdoor lab, library, classroom...). The students will create the best map that they are able – utilizing the school grounds and the grid paper. The map must incorporate a title, orientation, scale, data collected, author and legend. The second piece of grid paper may be sent home to create a more accurate map of their personal space.

Day 3

8. Introduce cardinal directions (North, South, East, West). Relate to the globe and to the flat maps. Then, relate to the classroom orientation. Place signs (North, South, East, West) on the appropriate walls.
9. Have the students look at their school grounds maps. Can they determine the cardinal directions on the map? They may need a little help. Or you may need to walk to the location to determine the cardinal directions. Place an orientation symbol (usually an arrow pointing North) on the map.
10. This is a good time to introduce aerial photographs, too. You can print an aerial photograph of your school property. This will help the students to determine cardinal directions, too. And this will help the students understand perspective (bird’s eye view).
11. Ask the students to take home their personal space maps and to identify the cardinal directions on the map. They may need assistance from home or from you upon return to the classroom. Utilize an aerial photography showing their home in order to determine appropriate orientation.

Day 4

12. Introduce the students to the concept of maps being a collection of layers of information – just like in the book “Me on the Map”. GIS (geographic information science) is a computer tool that allows us to quickly create maps by adding or deleting layers. Compare a GIS (or map layering) to a “big layered sandwich”. (Example: Big Mac, Whopper, Subway, etc...) Each person, place or thing represents one point of information on the Earth’s surface. And each point of information can be part of a group (or layer) – like three pickle slices on a hamburger are part of one layer of the sandwich. Five pieces of lettuce are one layer. Fifty French fries on the side create one layer. Each layer represents a different aspect of their world. Together, the layers all tell a story.
13. Re-read the story, *Me on the Map* by Joan Sweeney.
14. Ask the students to name the “layers” of the story and list them on the board/overhead.
(Room, house, street, town, state, country, continent, world)

15. Distribute the two-liter bottles (plastic cups). Explain they will be making their own “layered world” starting with themselves and building to the entire world.
16. First layer: Gummi Bears = the students
17. Second layer: Hershey Kisses (one per student) = their house
18. Third layer: red licorice = street
19. Fourth layer: gridded pretzel = town or city
20. Fifth layer: flag of Indiana on a toothpick stuck into a gum drop
21. Sixth layer: flag of the USA on a toothpick
22. Seventh layer: world/blue balloon on top
23. The “My Layered World” is complete.
24. Discuss the various layers that the students can see from the side. Finally, work backwards taking they layers apart – Earth down to me.
25. Relate to the personal maps and school grounds maps that the students created. What types of layers are in those two maps? Look at the various flat maps again. What types of layers do the students see in those maps?
26. Next, move onto the “M & M Community” activity (visit the GENI website at <http://www.iupui.edu/~geni>) which depicts individual points of data, layers of data, and multiple layers of data. This also introduces the concept of points, layers, maps, GPS (global positioning systems), and GIS (geographic information systems).

Assessment:

1. Creation of a personal map with appropriate graphics, title, author, and date.
2. Addition of a grid system to their personal map.
3. Adequate explanation of latitude and longitude appropriate for grade level language skills.
4. Development of a school grounds map in a small group. The map must include title, orientation, date, scale, data, author and legend.
5. Demonstration of cardinal direction comprehension (based on personal map and school grounds map).
6. Appropriate behavior (active listening, follow directions) while participating in the “Me on the Map” layering activity.

Adaptations/Extensions:

- Add a county layer for a fourth grade level.
- Use different representative items; such as Monopoly houses = house layer, Skittles or M & M’s = house layer, On the card stock cut-outs, tape one M & M for the house layer and tape five for the town layer.
- Make a mobile using the layer...
 - Earth
 - North America
 - United States
 - Indiana
 - County
 - Name of Town
 - House
 - Person/student
- Have a Jell-o party. The Jell-o should be made in layers.
- Use the analogy of an ice cream cone...
 - Cone = student
 - Dips = each additional layer
- Share with the students the following books...
 - *Zoom* by Istvan Banyai ISBN: 0-140-55774-1
 - *Re-Zoom* by Istvan Banyai ISBN: 0-140-55694-X
 - *Cookie Mining*

Resources:

1. Sweeney, Joan. *Me On A Map*, Crown Publishers, Inc. 1996. ISBN: 0-517-70095-6
2. www.esri.com – An introduction to GIS (see attachment)
3. www.terraserver.microsoft.com – Aerial photographs

4. <http://education.ssc.nasa.gov/ltp/LessonPlans/GradesK-3.htm> -- lesson plans developed by teachers to provide classroom activities related to Remote Sensing/GIS/GPS
5. <http://www.gislounge.com/l/k12education.shtml> --
6. Collection of references and tutorials on how to teach GIS to K-12 level students. Find lesson plans, user groups and more in the category