Understanding Earth's Surface Through Map Reading

Level: Grades K-2 **Facilitator Guide**

I ESSON DETAILS

Objective: Students will explore the basics of maps through a story, making a map of their school, and analyzing local maps.

Standards NVACSS and NGSS

- K-ESS3-1: Communicate solutions that will reduce the impact of humans on land, water, air, and other living things in the local environment.
- 2-ESS1-1: Use information from several sources to provide evidence that Earth events can occur quickly or slowly.
- K-2-ETS1-1: Ask questions, make observations, and gather information to define a simple problem that can be solved through the development of a new or improved object or tool.
- DCI: Human Impacts on Earth Systems; Developing Possible Solutions; The History of Planet Earth; Defining and Delimiting **Engineering Problems**
- SEP: Asking Questions and Defining Problems; Analyzing and Interpreting Data; Engaging in Argument from Evidence
- CCC: Scale, Proportion, and Quantity; Cause and Effect; Patterns **Career Readiness**
- 1.2.6: Demonstrate lifelonglearning skills by continually acquiring new industry-related information and improving professional skills.

Materials

- a variety of maps (world, country, local) to project
- *Me on the Map* by Joan **Sweeney**
- paper
- crayons or markers
- building blocks or simple toys for creating models
- stickers (optional)

Lesson Summary

- sand or gravel to simulate the ground in the model
- trays
- copies of a current and historical map for the same area
- · Google Earth or similar digital map tool
- clipboards (optional)

Students start by exploring maps through the children's book Me on the Map by Joan Sweeney, which introduces them to different types of maps and their uses. They then create their own maps by setting up block models of neighborhoods, helping them understand bird's-eye view and basic mapping skills. In an optional activity, students simulate an earthquake, reconstruct their model, and create a new map to reflect the changes. They then analyze a local map to identify and discuss both natural and man-made features, as well as environmental impacts of human activity. This exploration extends to examining historical maps to observe changes over time. Students enhance their mapping skills by creating detailed maps of their school. The lesson ends with students proposing locations for a community garden on their local map.

Preparation

For **Explore**, set up the substrate for the student models so that it is loose on the bottom of the containers. Packing the substrate too tight will lessen changes caused by the students' earthquakes and will limit the amount of change that occurs in their models.





Engage

- 1. Start with a reading of *Me on the Map* by Joan Sweeney, which introduces maps and how they relate to our environment from a personal perspective to a global scale.
- 2. Display a variety of maps including a world map, a country map, and a state map. As you show each map, point out the differences in scale and detail. Also, help the students locate their own area, as the main character does in the Me on the Map.
- 3. Engage students in a discussion about what maps show us.
 - What features can you find on these maps?
 - ▶ What differences do you notice between the world map and the state map?
 - Can anyone point out where we are on each of these maps?
- **4.** Encourage students to think about how they would draw a map of their own neighborhood or route to school. Ask:
 - What would you include on your map?
 - ▶ Why do you think it's important to show certain features on a map?
- **5.** As students examine the maps, encourage them to express what they are curious about. This could be features on the map, colors used, shapes, or symbols they don't understand.
- 6. Discuss why areas might look different over time, starting with familiar examples like a new playground being built or a park expanding. Then, explain how larger events, such as small earthquakes, can shift things around. Highlight how these changes require us to update our maps to accurately reflect the area as it is now.

Explore

- 1. Have students use the provided materials (sand, gravel, blocks) to construct a small neighborhood or community within their tray. Encourage creativity in arranging their setups to represent different areas like parks, houses, and schools.
- 2. Discuss the concept of a "bird's-eye view", explaining how it helps us see large areas from above.
- **3.** Have students draw a map of their created neighborhood on paper, using crayons or markers to represent different features.





- **4.** Introduce the idea a community might change due to an earthquake:
 - ▶ What might occur that could change the community you built?
 - > Which of these changes that was mentioned are human-made changes, and which are natural changes?
 - Have you ever experienced an earthquake?
 - ▶ Explain the concept of earthquakes and how they can affect buildings and landscapes.
- **5.** Have students gently shake their trays to simulate an earthquake, observing how the structures and landscape change or are displaced.
- 6. After the shaking, allow students to rearrange or "repair" their neighborhoods as they see fit, attempting to restore or improve the layout based on the damage.
- 7. Ask students to create a new map of their adjusted neighborhood.
- **8.** Facilitate a discussion comparing the before and after maps. Have students discuss the changes and reflect on how the simulated earthquake affected their neighborhoods.

Explain

- 1. Display a local map on the projector and hand out a copy to students.
- 2. Ask them what they see on this map:
 - What is something interesting you see on this map?
 - What places or features do you recognize?
 - ▶ Where is this map showing? How can we identify the location using the map's features?
- 3. Highlight and explain various map symbols using the legend.
- 4. Have students locate and circle features like parks, rivers, and forested spaces on their maps.
- **5.** Discuss with students how these features are beneficial to the natural environment, especially with regard to reducing human impacts.
 - ▶ Why do you think these places are important for our natural environment?
 - How might they help reduce negative impacts from human activities?





- 6. Hand out a historical map of the same area from step 1. Ask students to identify areas on the map that are the same and areas that are different. (Example: Las Vegas, NV map from **1950's** vs. **2020's**.)
- **7.** Discuss how the area has changed:
 - What changes do you notice?
 - Why do you think these changes happened?
 - Do you think these changes have been good or bad for our environment?
- 8. Project an interactive digital map, such as Google Earth, and visualize changes over time by toggling between historical and current views. (Example: Las Vegas Historical Imagery)

Elaborate

- 1. Start by telling students about a hypothetical new student who is joining the class and needs help finding their way around the school.
- 2. Divide students into groups based on their proficiency with mapping skills.
- 3. Assign different mapping tasks to each group:
 - **a.** Beginner Group: Focus on drawing a detailed map of the classroom, including major features like the teacher's desk, student desks, entrance, and any other significant elements.
 - **b.** Intermediate Groups: Task these groups with creating maps of key areas around the school such as the cafeteria, library, main office, and bathrooms. Encourage them to include details like doors, windows, and emergency exits.
 - **c.** Advanced Group: Have this group create a broader map of the entire school campus, including buildings, exits/entrances, playgrounds, parking lots, and sports fields. They should use a simpler scale but ensure all critical areas are represented.
- **4.** Provide students with materials and let them explore the areas they need to map. Encourage them to take notes and make preliminary sketches on their clipboards.
- **5.** Back in the classroom, students should use their notes and sketches to create more formal maps. Instruct them to include symbols for different features and develop a key or legend for their maps.
- 6. Optionally, have students share their maps with the class for review. The class can provide constructive feedback on clarity, accuracy, and the usefulness of the symbols and key. Allow students to make revisions based on feedback.
- 7. Have students share their maps with the class, explaining the symbols used.





- 8. Facilitate a discussion about the maps:
 - ▶ Imagine if we had a major change in our classroom, like moving all the desks around or adding new areas. How would that affect our map?
 - Why is it important to update our maps when changes occur? How often do you think we should check our maps for accuracy?
 - Discuss how new features or changes in school facilities, like construction of a new playground or changes in emergency exits, require us to create new maps. What steps would we take to update our maps?
 - ► How can keeping our maps accurate help not just new students, but everyone in our school community? Think about a time when someone might need to use the map besides during school hours.
 - What methods can we use to verify that our maps are accurate and reliable? Think about who could help us check the maps and what tools we might use.

Evaluate

- 1. Return to the local map used in **Explain**.
- 2. Introduce a community-based scenario: "Our city plans to develop a new botanical garden for everyone to enjoy." Modify the scenario to match local issues; for instance, if your town has a mining area, students could decide where to create a beautiful park after the mining is completed.
- **3.** Provide students with stickers or markers and ask them to identify potential locations on the map where the garden could be established.
- **4.** Discuss as a class where might be good places for the garden to be located, referring back to the map throughout the discussion. Prompt students to explain their choices by referring to specific features on the map, such as open spaces, nearby water sources, or densely populated areas.
 - Why did you choose this area for the garden?
 - How might this location benefit from a garden?
 - ▶ What challenges might we face with your proposed location?

