

Build a Map Activity

How Do Humans Modify the Environment?

Purpose: The purpose of this presentation is to present ways to use online GIS maps to teach students about how humans modify their environment. This lesson will also include ideas for extensions, other lessons, elements of a map, etc. Participants will learn skills that can be applied to concepts required by the elementary social studies TEKS and that can be modified for lower and upper elementary grades. Example TEKS include:

- A map of Houston will be explored to examine evidence of ways man has modified the environment.
- Colored lines will be drawn on the online GIS map to represent major modifications (e.g., roads, railroads, etc.)
- The lesson will conclude with applying these concepts to an elementary school and its community.

Let's Explore Houston:

1. www.tinyurl.com/FOG-elementary
2. Click on the **Open** button and then **Open in map viewer**
 - a. What do you see on the map?
 - b. Are there things used on the map to represent something in real life? What are they?
 - c. What are these representations called? (symbols)
 - d. What is a modification?
 - e. What modifications do you think you see?
3. Now, we are going to identify modifications on the map. Click on the **Modify Map** link on the top right of the page
4. Notice the circle in the center of the map.
 - a. Click on the circle. What circle? Where?
? What does the circle represent? (answer)
5. First, draw what you think is the boundary of Houston. Hint: Use the darker shaded gray area around the Houston city center.
 - a. Click on the **Edit** button on the top left of the Contents.
 - b. Click on the **Freehand Line** tool.
 - c. Move the mouse onto the map and click and hold the left mouse button down. While the left mouse button is depressed, move the mouse around the shaded area.
 - d. When you are finished drawing the boundary of greater Houston, release the left button.
 - e. In the box that pops up, type in the words "Greater Houston" where it currently says "Line."
 - f. Click on the **Close** button.

6. What shape do you see? Why do you think it is shaped that way? What are the major ways that an environment is modified to make a city? We are now going to focus on roads. Draw the major roads in Houston. (The goal being to have the students decide which ones are the main road.) What are the major roads? How do we decide?
 - a. Use the same procedure described in Step 5 using the **Freehand Line** tool or the **Line** tool.
 - b. In the box that pops up, type in the word "Major Road" where it currently says "Line."
 - c. If you wish, the students can choose the Change Symbol button in the popup box and then change the color and line width of the major roads they are drawing.

? What shape do the roads relative to the greater Houston area look like? (A wagon wheel with spokes...kind of)
7. Using what you have learned in the prior steps, have the students draw the inner and outer loops.

? Why do these two roads circle the city? What is the purpose? What road patterns do you see? Is there a relationship between the shape of the city and the roads? (Expected answers include: Radiating out from the city center, circles spokes, etc.).
8. Are waterways a modification to the environment? Can they be? How? (Explain that some natural waterways have been widened, deepened, or straightened for different purposes.)
9. Waterway example: Houston Ship Channel. Finally, draw and color the Houston Ship Channel starting at the San Jacinto River in the east and drawing west until it gets to Houston. Hint: The Ship Channel is the old Buffalo Bayou that has been altered over time.

? What do the roads and Houston Ship Channel provide for the city of Houston? Why were modifications such as roads and the Ship Channel made? Are they good or bad? Explain. Should modifications be categorized as good or bad?
10. How does a simple discussion of the human modifications to the Houston area lay the foundation for future lessons?
11. Now, what if we brought it down to a smaller community level? Example: Elementary school in CCISD (Whitcomb Elementary). Can we have similar questions? Symbols? What do you observe/notice? Identify what you think as a modification—what are the changes that man has made? Why were these changes made to the environment?
12. Now, change the base maps. What other questions can you ask of the students?
13. What else can be done using free online GIS maps at the elementary level? What kinds of lessons would you like to see? How can we use online maps to teach other disciplines?