

Internal Spatial Structure of Cities

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Standard Title: Strand V – Geography

Substrand F – Spatial Organization

Standard – The student will be able to analyze the patterns of location, functions, structure, and characteristics of local to global settlement patterns and the processes that affect the location of cities.

Benchmark #5 – Students will explain the internal spatial structure of cities in the United States.

Grade Level:

9-12 grade.

Title: Internal Spatial Structure of Cities.

Overview:

The students will be analyzing a typical North American city through the means of bid-rent. This concept will explain why commercial, industrial and residential sectors of the city are located where they are located. Students will be able to discuss and evaluate the population densities and characteristics of land-value outwards from the Central Business District (CBD).

Time:

5 class periods on an 84 minute block schedule. Two class periods of student research.

Subjects:

Human Geography

Required Materials:

Copy of the Bid rent curve from the 2004 Advanced Placement Human Geography exam. (included in this lesson).

Computer technology.

Optional Technologies:

Digital cameras to allow students to take pictures of the different areas within their urban structure.

Objectives:

The student will be able to...

1. Differentiate between commercial, residential, and industrial land use.

2. Compare and contrast land values between the Central Business District and the surrounding areas using the concept of bid-rent
3. Evaluate population pyramids of different areas of the city based on demographic needs of people who live in certain areas.
4. Analyze transportation patterns in the urban system and their relation to land value.
5. Assess the difference between land value and housing value.

Opening the Lesson:

Day 1 and 2 -

Show students a copy of the urban structure question located on question three of the Advanced Placement Human Geography exam on the 2004 copy. Student should discuss the reasons why different areas of the city look and show the demographic characteristics that they do. Teachers can find the question at the following website...http://apcentral.collegeboard.com/repository/ap04_frq_human_geo_36112.pdf

The teacher should discuss the concept of bid-rent. This concept suggests that the land around the Central Business District is the most valuable land in the urban area due to its accessibility in relation to the transportation systems around the urban area. As the distance increases from the urban area, the land value decreases until you reach the suburbs where the land value is the least. Because the land value is the lowest in the suburbs people can afford more land on bigger houses. The teacher may want to bring up the difference between land value and housing value. Housing value is usually greater in the suburbs due to the size of the house. However, the land is much more valuable as the distance to the urban center increases. This explains the increase in multistory apartment complexes and the apartments.

During this mini-unit, students will be looking at housing values and land values in the Twin cities metropolitan area. They will be doing this through data collected from the city and real estate property, which are public records. By doing this activity, students will assess the validity of the graph that they just discussed.

The students will get a map of the Twin Cities. Students will get a certain sector of the city and they will be working in groups of three to four. Students will need to be in groups due to the amount of calling and work that will need to be done.

All students will get a copy of the Twin Cities road map. These can be purchased at any local gas station. Students will need to highlight the major transportation systems in the map. They can highlight the four means of industrial transportation in the Twin Cities. They will need to find the major airports, interstates, train tracks and ports. If students can find pipelines they can also add that into their map analysis.

Once students have gotten their maps highlighted based on their transportation system students will begin looking at demographic data on <http://www.factfinder.census.gov/> This site will give them demographic data at a block level of their choice. Students can evaluate the validity of the population pyramids

located on the test. For the housing values they will need to call a real estate office and have them put a monetary value on the CBD's of downtown Minneapolis and St. Paul. Students should chart this information on their map and produce a choropleth map either by hand or on GIS software that shows housing value in the city.

The class will be split up into a minimum of four directions and preferably eight including cardinal and intermediate directions for a true analysis to take place. Students will need to do demographic and land value surveys and two mile intervals until they reach an area at least ten miles out. Population pyramids will be drawn at each interval to evaluate land use patterns.

Students should see that immediately around the CBD there is a large percentage of commercial activities located there. The primary reason for this is that the value of the land is so high that residential users cannot compete with the land and therefore must be ceded to the highest bidder, which is commercial and industrial. Just outside the CBD, the population density will still be low due to the high value of the land. This land should be occupied by a mix of commercial and industrial land activities. Then as they move into the intermediate zone they will see the bulge in population density. The reason for this is the abundance of apartment complexes. Since the price of land is high here, residents cannot afford it by themselves and must share the cost of the land. This causes apartments and high rise buildings to be built due to the economics. Although the cost of the land is high the housing value is somewhat low due to the social problems of the city (i.e. crime, lack of space, etc.)

As students continue to move farther out the population density will continue to decrease but the housing value should increase due to the bigger lots that people are able to afford. The opportunity cost of living in the suburbs with the bigger lots and more space is the increased traffic time and lack of transportation systems in the suburbs. People living in the urban areas are usually the elderly and the young adult working people who have no children due to the lack of space which is not needed.

Students should be producing these results as they move outwards from the urban center.

By evaluating land value and population demographics as well as density they are associating with either the concentric zone model, sector model or the multiple nuclei model of urbanization in the United States cities. Students will assess their map when completed and determine which of the following models best fits their results. Students should debate the effectiveness of the models they saw on the questions mentioned earlier.

Students will have produced a land use map of the Twin Cities in eight different directions (north, northwest, west, southwest, south, southeast, east, and northeast). By doing this they will have differentiated between industrial, commercial and residential land use.

For an extension activity students can take pictures of the areas that they are studying.

Definitions:

Taken from James Rubenstein's book "An Introduction to Human Geography: A Cultural Landscape. 8th ed." Pearson Prentice Hall. Upper Saddle River, New Jersey. 2005.

1. Census Tract: An area delineated by the U.S. Bureau of the Census for which statistics are published; in urban areas, census tracts correspond roughly to neighborhoods.
2. Central Business District: The area of the city where retail and offices activities are clustered.
3. Concentric Zone Model: A model of the internal structure of cities in which social groups are spatially arranged in a series of rings.
4. Density Gradient: The change in density in an urban area from the center to the periphery.
5. Gentrification: A process of converting an urban neighborhood from a predominantly low-income renter-occupied area to a predominantly middle-class owner occupied area.
6. Multiple Nuclei Model: A model of the internal structure of cities in which social groups are arranged around a collection of nodes or activities.
7. Sector Model: A model of the internal structure of cities in which social groups are arranged around a series of sectors, or wedges, radiating out from the central business district (CBD).
8. Urbanized Area: In the United States, a central city plus its contiguous build up suburbs.

Web Links for Teachers and Students:

<http://factfinder.census.gov/home/saff/main.html> This site provides demographic data at the block level for different areas in the country. Users can produce choropleth maps of different neighborhoods or find the data.

<http://www.mapmart.com/> This site will give aerial photographs as well as topographic maps on a certain area within the United States.

Discussion Questions:

1. Why is the CBD land so valuable?
2. Why don't as many people live near the CBD? Why is the bulge some distance away from the CBD itself?
3. Why are houses in the suburbs usually bigger than houses in the urban areas?
4. What are the demographics of the people who live in area X as compared to areas Y?
5. Why would more families live in area Y rather than area X?

6. Why would more young professionals without children choose to live in the urban center rather than in the suburbs?