

Land Use Over Time

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Strand V: Geography

Substrand E – Essential Skills

Standards – The student will use maps, globes, geographic information systems and other data bases to answer geographic questions at a variety of scales from local to global.

Benchmark 2 – Students will make inferences and draw conclusions about the character of places based on a comparison of maps, aerial photos, and other images.

Grade Level: 9-12

Overview:

In these lessons students will be evaluating different land uses over time using a particular plot of land determined by the teacher. Students will be looking at topographic maps and aerial photos using old maps provided from their local library or they can use the topographic maps located on the website at Johnson High School. They will then compare these with recent data on the internet. Students should use <http://www.mapmart.com>/this site contains topographic, aerial photos, and Digital 3D images for their particular location, which is any place in the United States. Students can also get satellite images for their location. Students will then assess the major land use patterns in their area and compare/contrast the old maps land use patterns with the new land use patterns. Students should also look for toponym changes, road construction, suburban development, etc.

Time:

4-84 minute periods

Subjects:

Geography

Environmental studies

Required Materials:

1. A set of old topographic maps, aerial photos, or plot maps from a particular location that are at least 50 years old or show the land a minimum of 50 years ago.
2. A computer for each student or group to access the web and acquire the new topographic data.

Optional Technology: Level III Possibilities:

Students can put their research and scan their old maps and use the new technology to present a PowerPoint Presentation, Imovie Presentation, brochure, play, etc.

Objectives:

Students will evaluate the major land use patterns over time by using maps that are at least 50 years old and comparing them to present day land use maps. Students will then analyze the land use patterns using the four land use decision-making models.

Opening: Level 1 Activity:**Reason for Activity:**

I selected this activity because it fits perfectly within the framework of a unit on Land Use and Natural Resources. This activity gives students a practical lifelike experience using GIS and other geographic data with the potential to easily move it to a type III experience. The type two activities allow the students to explore their areas in depth and find out more information. I give them the places to find the information but it up to the students to gather the information and organize it in a fashion that would make sense to a geographer. The type three activities would be the extension activities where they could present their finding to a city council on a format that they see fit. The type one activity has been done in my class and the students like the freedom and like to have the creativity to draw anything that they like on their plot of land. Many of them will use their artistic ability and participate when otherwise not inclined to do so with overhead notes or other traditional methods of delivery. Students like this activity because they get to find the results. They are getting pieces of the puzzle and must connect them in a way that they see fit. This lesson uses a variety of teaching as well and learning styles. Each learner learns in different ways. By using this variety, students will find one thing that they “come aboard” with. Once they’re hooked, they are at a teachable moment.

Day 1: The students will get a blank sheet of paper. Students have the assignment that they won the lottery and won one square mile of land. They can build anything that they want on the land and use it in any fashion that they would like. They can leave it alone if they wish but must draw what it is like in the absence of any development if they chose to go that route.

Students will be presented with the following notes on the four major land use decision-making models:

1. **Economic** – This land use model suggests using the resources for human benefit now. It wants to establish development as a core principle and use the theme of money of the land in any decision regarding use of the land.
2. **Sustainability** – This land use model suggests using the resources but saving some for future use. It wants to use more alternative energy sources due to the timeline of the diminishing return on the fossil fuels availability. Use but do not abuse.

3. **Environmental** – This land use model suggests using the land but keeping the land in its natural state. The land could be modified in part but kept in its natural condition. A park would be the ideal example of an environmental land use.
4. **Preservationist** – This land use model suggests that humans leave the land untouched. This borders on a religious fanaticism. It is good for the human soul to know that there is land, which is not spoiled by human activity.

After students discuss the four land use decision-making models, they will write a paragraph on the backside of their drawings explaining which land use model they used and where it was used in their drawing. Some students may have used more than one. If they did they need to describe where each one was used.

Other Type I Activities:

1. Field Trip to a Wildlife Refuge, suburban development, and timberland area. This would show three main land use decision-making models.
2. Guest speakers. One could be a park ranger, one could be a forester, and one could be a housing developer.
3. Students find examples of the decision-making models within their own community.
4. Read a book on the forest industry.
5. Collect data on wildlife areas or fishing stocks in Minnesota.
6. Students can go map out their areas and determine land use patterns in a particular location selected by the teacher.

Day 2-3: Type II Activities:

Students are handed their older maps from a particular location. The maps that I gave my students were 1950's topographic maps of the state of Tennessee. These maps were an invaluable resource. The maps are old enough to show a distinction in land use over time. Each student should have their own map or students can work in groups depending upon the number of maps available. Students should notice several factors on the map, which could include:

1. Major roadways
2. Major drainage patterns if using a topographic map.
3. Major urban areas or towns.
4. Major environmental projects (i.e. dams, spillways, golf courses, mining pits, etc.)
5. Toponyms – have any changed names in the time span between the two maps? Are there any names that are racist or derogatory to a specific group?
6. Contour Intervals – how hilly, flat or mountainous is your map?
7. Natural Features (i.e. mountains, valleys, etc.)
8. What are the land-use models evident on the map and where are they? (I.e. parks, wildlife refuges, forest clearings, development, etc.)

Students should use the older maps and compare them to the one located on <http://www.mapmart.com/> Students will find their area on the site and evaluate the old map with the new one. Students should do the following to get the correct location on the site.

1. Type in <http://www.mapmart.com/>

2. Select the icon in the lower middle of the homepage that reads “USGS Topographic Maps.”
3. Select the icon that is under the 24K theme and click on begin.
4. A map of the United States will appear. Click on the area that you would like to study. Continue to click on the area to enhance the image. Students will have the choice to view it in the topographic format, satellite format or a DEM format which is a three dimensional representation of the area. My students had to go to the Tennessee section of the map and find their topographic area.
5. Once they have found their area down to the topographic level, students should begin to evaluate the new map for the same criteria that they evaluated the old map.
6. Students must then compare and contrast the two maps to notice changes in the environment. Students should answer any or all of the following questions:
 - A. Have any new roads been built since the last map?
 - B. Have any of the urban areas expanded and how far?
 - C. Where has the development taken place on the map?
 - D. Are there any changes to the watersheds?
 - E. Have any of the toponyms changed on your map?
 - F. What is the population of your topographic area? Students can use the demographic data provided on <http://www.mapmart.com/> or they can go to the <http://www.factfinder.census.gov/> site to find more in depth demographic data.
 - G. What is the average income for your topographic area?

By doing this activity, students are getting research skills as well as fundamental basics of using GIS and GPS data. Both of these skills are fundamental in the new geography standards.

Students can use any of the following resources for their projects:

1. <http://www.mapmart.com/> – This site gives a detailed description at the 1:24,000 level.
2. <http://www.usgs.gov/> – This is the official site of the United States Geological Service.
3. <http://www.factfinder.census.gov/> – This is an incredible site detailing the demographic characteristics down to the block level of any place in the United States. Use it to assist you in finding your demographic data.
4. <http://www.imagepeaksystems.com/> – This site gives the same information and maps as the Mapmart site but is a little more complicated to use. Users must go to the Gecko Software section and start. Users can find great detail on places in the United States.
5. <http://www.teraserver.com/> – This site run by Microsoft gives aerial photos of individual locations around the United States. Most areas in the United States are covered but the photos are from 1991 and are a little bit outdated.

Day 4 – Type II Activities Continued:

Students will now present their findings to the class. Community professionals could come in to give feedback on their land use sites if the topographic maps that they were using were of their own community. Student will present two major items on their maps and how they have changed in the past 50 years. It may be a new interstate was created or names have changed. Mining areas may have been replaced or started. Urban development may have taken over farmland. Anything along these lines can and should

be used by the students in their presentations. Students will have the flexibility to create their own presentations. Students should be creative in how they introduce their areas.

Closing: Assessment:

Students will be turning in some type of presentation report that suggest that they are a Land Use planner for their specific area. Students need to make suggestions on what they thing the next 50 years should look like in their area. Where should the additional development be concentrated? How are the land uses changing during their lifetime? They need to tie this into the four land use decision-making models. Where are each one of these models exhibited on their maps? Should it stay that way? They must persuade and back-up any recommendations that they have.

Extension: Type III Activity:

If possible, these could be sent to the city council for further debate and discussion. They will present their findings at a city council meeting or at an environmental focus meeting. Students could also meet with city planners and discuss the city's vision for land-use planning in the next 50 years. The focus needs to be on people who have the power or the authority to make the land-use decisions now.

A Look Back:

There are a couple of things that went really well for me when I did this with my students. The students really enjoy getting on the floor and looking at maps. It gets them out of the desk and more importantly they are investigating and applying research skills. Students like to learn and explore. This activity allows them the opportunity to do just that. It also gives them the flexibility to use their gifts in how they present the material to their classmates or to a community professional if the Type III extension is used.

When I did this a first I overestimated their ability to extract data from a topographic map. We had to go over more of the map reading skills that were covered previously in the year. This could be another type I activity associated with this assignment. The students wanted to know what individual markings and lines were on the maps. The topographic maps use symbols that are not always obvious to the layperson. It is a skill that probably needs to be reinstalled at the beginning of the lesson.

We did not do the Type III extension because we focused on the Tennessee region with the 1950's topographic maps. These maps are treasures that should be stored away in a golden box. The 1950's in Tennessee were a turbulent time. Many of the place names were racist (Niggerbone Hill, etc.) and the Tennessee Valley Authority had completed most of the dams in the region changing the physical environment for decades to come. The differences between the western section of Tennessee, which is primarily farmland and the eastern section of Tennessee, which is primarily mountainous and used for either mining or given environmental status gives a stark contrast concerning land use. It was the perfect state for this assignment. It gave the students enough variety in landscape features to make it different and not have 20 presentations on the same type of land use.