

# **Got Park? Or If you build it, they will come!**

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Danville Community High School  
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**Classroom sessions/estimated time:** Three or four 73-minute class periods.

**Grade level(s):** High school students grades 9-12.

**Purpose:**

To provide students an opportunity to use GIS and GPS technology to evaluate, research, locate, and recommend where a new park should be located that will benefit the community.

**Geography Standards addressed:**

*National Geography Standards*

- 1. How to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective.
- 12. The processes, patterns, and functions of human settlement.
- 14. How human activities modify the physical environment.
- 18. How to apply geography to interpret the present and plan for the future.

*High School Course Objectives*

- The student knows and understands how to use geographic representations and tools to analyze and explain geographic problems.
- The student knows and understands the functions, sizes and spatial arrangements of urban areas.
- The student understands the evolving forms of present-day urban areas.
- The student knows and understands how to use geographic perspectives to analyze problems and make decisions.

**Indiana Academic Standards addressed:**

*World Geography*

- WG.1.3 Use locational technology (remote sensing, Global Positioning Systems [GPS] and Geographic Information Systems [GIS]) in order to establish spatial relations.
- WG.4.2 Develop maps of human migration and settlement patterns at different times in history, and

*High School Course Objectives:*

- Students will use maps, globes, atlases, and grid-referenced technologies, such as remote sensing, Geographic Information Systems (GIS), and Global Positioning Systems (GPS) to acquire and process information about people, places, and environments.
- Students will identify and analyze the human activities that shape the Earth's surface, including population numbers, distribution, rural and urban

compare to the present.

land use. Using grid-based technology, such as remote sensing and GIS wherever possible, they will map the distribution of various human phenomena and look for spatial patterns that the maps reveal.

WG.5.9 Develop possible solutions to scenarios of environmental change brought on by human activity.

Students will analyze ways in which humans affect and are affected by their physical environment.

WG.6.6 Evaluate the impact of human migration on physical and human systems.

Students will understand the influence of physical and human geographic factors on the evolution of significant historic events and movements. They will apply the geographic viewpoint to local and regional problems.

### **Background:**

- Students will have had prior lessons in topographical maps, mapping skills, and experience with atlases, globes, and gazetteers.
- Students will be given a brief overview of GPS and GIS technology. Lectures based on PowerPoint presentations will introduce the technology but hands-on use will be practiced in the computer lab or the field. Several selected websites such as Terraserver will be investigated prior to this lesson so that students are familiar with the maps.
- Students will be introduced to the town park system by the park Superintendent Brad Andrews. Mr. Andrews will explain the history, area and facilities of our current park system.
- A member of the town Park Board will present the students with the problem of creating another park within the town boundaries.

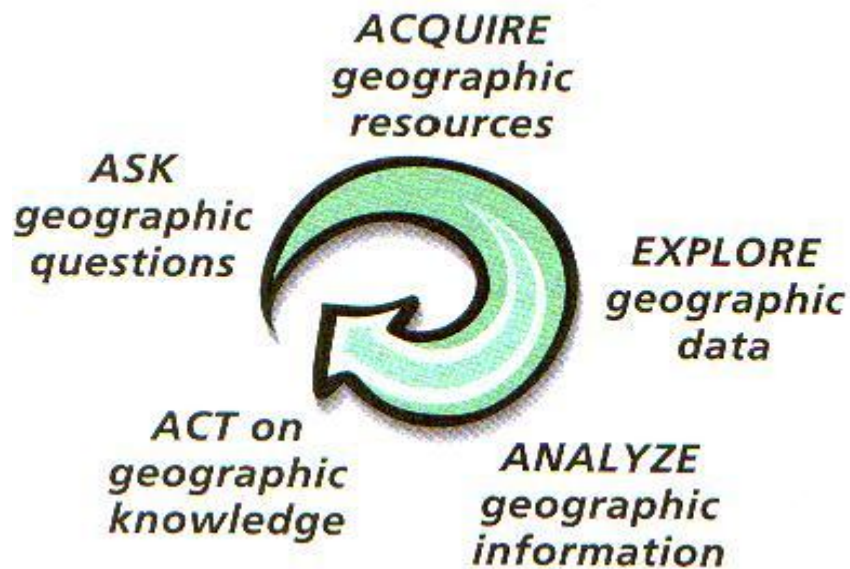
### **Materials Required:**

The following materials will be required to perform the lesson.

1. Topographical maps of the town and county.
2. Access to the computer lab for 2 days.
3. Internet access to Terraserver and other websites.
4. Access to the town park for 1-2 days.
5. Clipboards for each team.
6. As many GPS units as possible. Students may bring their own units to facilitate their investigations.
7. Access to potential properties deemed suitable for the lesson.\*
8. Other materials will be added as necessary.

\*Instructor will arrange prior approval with property owners so that there are no trespassing issues.

**Procedures:**



**Teaching Tips:**

**Day 1:**

Prior to the students' arrival in class, maps of the state, county and town will be displayed around the classroom. Display an aerial map of the town utilizing the computer and projector.

Introduce the lesson by explaining that the Town Council has a dilemma and that they need the help of all the citizens to solve the current problem of overuse in our current parks. Allow the students 5-10 minutes to brainstorm about possible solutions to solve the problem. Students will write on the chalkboard possible solutions and the merits of each idea will be discussed.

Some students will invariably decide that a new park is needed. Tell the students that this will be the focus of the next few days.

Have students divide into groups of three or four.

\*One group of two students will be assigned the task of recording the entire program using digital still and video cameras. They will create a PowerPoint program that explains the entire experience.

Explain that the students must utilize GPS, GIS and other technology to produce a map, a PowerPoint presentation and a brochure that will showcase their solution to the problem.

Take the students to the computer lab and direct them to view a quick historical growth of the town via aerial photographs. ([www.lib.purdue.edu/eas/aerialptab.html](http://www.lib.purdue.edu/eas/aerialptab.html)). Students will get an idea of the growth patterns of the town and be able to hypothesize

where most of the growth will occur in the future taking into account the current town and county infrastructure.

Give the students 20-30 minutes to investigate the maps and come up with a hypothesis for where they believe a new park could best serve the community.

Have Team members choose which task they will perform:

1. Mapping
2. PowerPoint
3. Brochure
4. Presentation

*\*Students will all share information and help gather data.*

### **Day 2:**

Field trip to the town parks to investigate what infrastructure is currently being utilized. A brief meeting with the park superintendent will give the students a refresher in the current parks and the stresses they receive because of overuse.

Students will break up into their assigned groups and investigate the park for 20 minutes.

Regroup at the new shelter building and spend 10-15 minutes discussing bare minimum facility requirements for a park and what would be ideal.

Return to the school computer lab to further investigate possible sites for the new park and contact landowners for permission to take GPS survey points the following day.

5-minute wrap-up to prioritize the 3 best areas for a new park.

If time allows, travel to one site of a potential park. This will probably be property already owned by the town and prior permission to investigate the area will be acquired.

### **Day 3:**

Field trip to the 3 best areas for a new park. Students will have prior knowledge of how to create points using GPS units and then translate the information. Teams will be required to create corner points and, if time allows, other points for roads, restrooms etc will be created.

Other team members will take digital pictures of the potential park area for the brochure.

GPS units and digital cameras will be shared by each group in the event that there are not enough to go around.

### **Day 4:**

Students will return to the computer lab and create a map using appropriate software and GIS maps. Borders and other landforms of the park will be drawn in. Other team

members will create a brochure utilizing the student generated maps and digital pictures.

Products will be printed out and the students will then give a short presentation of their products.

#### Technology Connections:

Students will use hand-held GPS units to acquire points that will be utilized to draw borders for a new park on a computer generated map.

Students will download maps in the computer lab using a variety of GIS-based websites. Using appropriate software or other available software, the students will create borders, roads, facilities, and identify landmarks and other structures.

Students will use digital cameras (both still and video) and download the pictures for use in their brochures.

Students will create and print a brochure using Microsoft Publisher.

Students will create a PowerPoint presentation to explain their rationale for creating their park in its particular location.

One group will also utilize PowerPoint to produce a record of the entire lesson.

#### Assessment:

##### High Quality

Students will create a high quality map using GIS technology.

Students will utilize a minimum of 8 GPS points.

Students will create a PowerPoint presentation to explain their project. Minimum of 10 slides.

Students will create a brochure explaining the benefits of their selection. Brochure will include: 2 student generated maps. 1 essay

##### Adequate Quality

Students will create an outline map using GIS technology.

Students will utilize a minimum of 4-7 GPS points.

Students will create a PowerPoint presentation to explain their project. Minimum of 6 slides.

Students will create a brochure explaining the benefits of their selection. Brochure includes: 1 student generated maps. 1 essay

##### Poor Quality

Students do not create a map using GIS technology.

Students will have fewer than 4 GPS points.

Students will create a PowerPoint presentation to explain their project. Less than 6 slides.

Students do not create a brochure.

explanation of their project. Use of 4 or more graphics images.

explanation of their project. Use of two or three graphics images.

Students are active in classroom and field activities.

Students are active in either classroom or field activities.

Students are not active in both classroom and field activities.

### **Adaptations/Extensions:**

- Assign students to create a new sewer plant that will be in an area to supplement the current system and not impede the development of the town.
- Challenge the students to investigate and produce a plan to create a bypass that will allow for more improved traffic flow.
- Have students investigate other communities of similar size and populations and compare their resources with that of Danville.
- Hypothesize what other amenities the town would like to acquire and how those items would affect the growth of the town both economically and population. What effects would this have on the environment?
- Students generate and maintain a website that displays their projects.

### **Resources:**

#### Electronic resources:

<http://atlas.ulib.iupui.edu/>

An electronic atlas that contains information about the metropolitan Indianapolis area including surrounding counties.

<http://in32.plexisgroup.com/map/index.html>

A program that supplies data concerning Hendricks County including electronic maps.

<http://missiongeography.org>

A listing of the national geographic standards, teaching modules and a collection of maps.

<http://plasma.nationalgeographic.com/mapmachine/>

The National Geographic Society map machine website that allows students to create their own maps.

<http://tiger.census.gov/cgi-bin/mapbrowse-tbl>

Electronic political map atlas provided by the Census bureau.

[www.teraserver.homeadvisor.msn.com](http://www.teraserver.homeadvisor.msn.com)

Mapping program that incorporates aerial and topographic maps.

[http://www.census.gov/geo/www/maps/CP\\_OnLineMapping.htm](http://www.census.gov/geo/www/maps/CP_OnLineMapping.htm)

U.S. Census bureau link to mapping programs.

<http://www.esri.com/gisforeveryone/>

A website dedicated to a quick overview of GIS information.

[www.lib.purdue.edu/eas/aerialptab.html](http://www.lib.purdue.edu/eas/aerialptab.html)

Provides many online maps for Indiana and other areas.

[www.in.gov/dot](http://www.in.gov/dot)

Indiana department of transportation website with electronic maps.

[www.nasa.gov/](http://www.nasa.gov/)

A clearinghouse of information about NASA including LANDSAT photographs and aerial photography.

Paper resources:

Indiana Atlas & Gazetteer, DeLorme, 1998, Yarmouth, Maine

Plat Map of Hendricks County

State Map, Indiana Department of Transportation, 2002

Town Map, Danville, Indiana, Greater Danville Chamber of Commerce, 2002

Human resources:

Brad Andrews, Superintendent of Parks, Danville, Indiana

Jeff Martin, Parks Commissioner, Danville, Indiana

Other individuals that the students may contact, including but not limited to:

Gary Eakin, Town Manager

Laura Qualitza, Town Planner

Rob Roberts, Superintendent of Public Works