

Overview

The Changing Face of Pennsylvania includes three activities:

Activity 1: *Learning from Aerial Photographs*

Activity 2: *Historic Timeline*

Activity 3: *Learning About Pennsylvania*

The activities involve skills in using maps, aerial photographs and data to help understand trends and changes. These tools are utilized to communicate graphic interpretation of information through a one-to-one correspondence between places, events and data—portraying them through a visual representation. Graphs, charts and tables of information on population, growth and land use help participants to visualize trends that impact communities, counties and the state. Understanding the trends helps citizens in formulating future actions and decisions.

A series of aerial photographs taken at intervals of 10 or more years of the same location provides an account of changes in the landscape over time. Participants will observe and document the changes caused by growth and development. They can determine the percent of change in developed land and project the possible growth that will occur in the future. Introducing geographic information systems technology (GIS) enhances the activity.

By examining maps of Pennsylvania and of their communities, participants gain an understanding of features of physiographic regions such as geology, topography, land cover, etc. that influence growth and development patterns.

Students develop skills such as observation of a physical space, integrating observations into a unified whole, orienting a consistent viewpoint, scaling (ratio and proportion), using symbols, evaluating content and making predictions.

Activity 1

Activity 1:

Learning from Aerial Photographs

Summary: Participants review aerial maps taken over time to assess changes in growth and development.

Based on the aerial photographs, participants measure and determine how the changes affect natural and human resources.

Aerial photographs of state parks, schools and communities may be available through the Bureau of Topographic and Geologic Survey at www.dcnr.state.pa.us/topogeo. A set of aerial photographs of the city of Lancaster in Lancaster County is provided and may be used for this activity.

Questions: What tools are available to assess land changes and help us make sound land decisions? How does growth and development impact natural resources? Why is it important to protect natural resources and natural spaces? What factors influence the location of development? What can you predict about future growth patterns?

Preparation

- Copy and prepare aerial photograph sets of different years for each group (pp 31-36).
- Cover dates with a removable piece of paper prior to distribution.
- Prepare a transparency of the grid for each group (p 38).
- Prepare Aerial Photograph Worksheet (p 37).
- Provide each group with erasable markers, a map, and question sheet.

Optional: Land cover maps, geology maps and topographic maps could be distributed to each group and used to enhance the lesson.

Procedure

Aerial photographs, geologic maps and topographic maps are helpful tools used in making environmentally and economically sound land use and planning decisions. The first aerial balloon surveys conducted in 1858 introduced a dimension to mapping that provided a map-like view of terrain without cumbersome surveying.

As early as the 1930s, land use planners used aerial photography to assist in mapmaking. Specially equipped airplanes fly identical routes over several years. These photographs are compared over time and provide very useful information on land use trends.

1. Divide participants into four or five teams. Discuss the procedures for working in cooperative groups. Each team receives a set of aerial photographs, maps, grid and question sheet.

2. Participants examine one aerial photo. Determine the different colors (shades), figures, shapes and lines indicated on the map. Review the map features. How do you identify farmland, cities, trees, rivers, railroads, small roads, main roads, houses, cemeteries, airports, ball fields/tracks, quarries, parks and suburban housing developments?

3. Ask participants to examine the photographs and place them in chronological order. Assess their progress by asking each group to share clues they are using to determine the chronological order of the maps.

4. When groups have completed their task, have them remove the paper covers over the dates and self assess their success. Reorder their maps if needed.

5. Compare the most current photo with a state or county map and determine the location of the aerial photograph based on the major highways. View available maps and discuss why people settled in areas and why uses occurred where they did.

6. Distribute an Aerial Photograph Worksheet to each group. Place the grid transparency over the earliest or oldest aerial photograph (1947) aligning the grid with the southeastern corner of the photograph. Using wipeable markers, outline and color the built or “paved” areas where houses, roads or industries are located.

7. How many squares are “built?” How many squares are green space or open space? Compare the number of squares that are developed to the number of squares that are farms or open space. Determine percentages for agricultural lands, built/paved lands and natural lands based on the number of squares for each land use.

8. Using the same transparency and a different color marker, select a map about 30 years later (1971) and repeat procedures as indicated in the previous paragraph. Determine percentages of built lands, agricultural lands and natural lands.

9. Select a map about 50 years later (1999) and repeat procedures with a different color.

10. Once land is developed, could it ever revert to natural lands or does it remain as developed land? Discuss when that might happen.

11. Compare and contrast the three or more aerial photos. Grids can be projected on an overhead.

12. Using a different color marker, outline areas where you predict development will occur in the next 10 years. Explain your reasoning. Make three recommendations for the future of this community.

Assessment and Review

1. *How did the periods compare?*
2. *What changes occurred over the years?*
3. *Why did development occur in certain areas?*
4. *What services and infrastructure are associated with development? (Discuss roads, highways, housing developments, wastewater treatment plants.) What are some of the problems expanding communities create? Why did the changes occur in those locations?*
5. *What impact does development have on natural resources such as land for wildlife habitat, surface water resources, groundwater resources, stormwater, erosion and air?*
6. *What actions can be implemented to conserve natural resources?*
7. *Many land uses alter wildlife habitat. Discuss how changes in habitats can cause changes in wildlife. Some changes destroy habitats such as filling of wetlands. Some changes create new habitat for wildlife, such as the increase in bird species at backyard feeders or increase in deer in suburban edges. Explain.*

Discuss if participants are aware of changes in their own communities? If you could have planned before the changes occurred, what would you have done differently? What trends would you like to implement?

Activity 2: Historic Timeline

Summary: Participants will develop a historic timeline of events that influenced land use practices. They will discuss past and future trends.

Question: What are the policies, technology and events that have influenced development and other land use patterns historically and presently?

Activity 2

Preparation

- Prior to the activity, prepare the timeline (p 39) on overheads or a flip chart.
- Prepare historical photos (p 40).
- Prepare sets of Historical Milestone cards for each group (pp 41-46).
- Prepare copies of Historical Timeline Worksheet for each group (p 47).

Procedure

In the previous activity we determined that communities change over time. Historically, there are periods of land use development that have been created by political, societal and population changes.

Certain government policies encouraged growth patterns. Such policies as the GI Bill of 1944 provided tuition assistance and mortgage subsidies to returning servicemen after World War II enabling American families to leave the cities to establish life in the suburbs. Levittown in Bucks County is one example of such a community.

The Federal Highway Transportation Act of 1956 created the interstate highway system. Federal and state governments poured millions into new highways that encouraged the outward movement of residents and industries from the cities yet they failed to put substantial funds into public transportation. People needed cars for transportation.

In the 1960s, the federal government promoted funding for low income public housing projects in cities. “Urban renewal” projects did not help old neighborhoods in cities like Erie, Reading and Altoona. The housing projects were measured as “successful” in renewing the quality of life in the cities, but in retrospect, instead of solving the