urban crisis, many housing projects contributed to urban deterioration.

1. Divide participants into four or five teams and discuss the procedures for working in cooperative groups.

2. Each team receives a set of historical event cards. Participants are to read the cards and place the cards in chronological order from past to present. Participants discuss the impact each event has on land use trends. *(Not all cards need to be given to each group.)*

3. Instructor displays the list of key events and milestones for historical land use. Participants assess and correct their card order as each event is reviewed.

4. Participants complete the Historic Timeline worksheet in a small group. Large group discussions review the worksheet and focus on how events impact changes in land use patterns and why.

Assessment and Review

What events, trends and technology will impact development in the future? What changes in land use are occurring in your neighborhood or community? Is there a new store, a greenway or a new park? Is there a new intersection, stop sign or traffic light? Is there a new development or is someone fixing an older home? What impact will these changes have on your community?

Activity 3:
Learning about Pennsylvania

Summary: This activity involves three parts. The first part participants explore information about Pennsylvania through a variety of maps to define physiographic regions and how the features of each region influenced early settlements and development patterns. The second part involves examining population trends by county to assess the regional differences in community growth and development. In the third part, participants analyze data to determine population and land development trends. Such information provides a platform for predicting future trends.

Question: What are the characteristics of land forms and land cover in Pennsylvania? How do features in the physiographic regions influence community growth and development? How do population trends compare across Pennsylvania? What are some of the past and future trends of growth and development in Pennsylvania?

Preparation

• Participants are to work in groups. Discuss the process of working in groups. Have each group assign a leader, recorder, timekeeper, and presenter.

• Copy and prepare sets of the following and place them at each work station to be used by participants working in groups:

  • Sets of Physiographic Region Cards and Photos (pp 48-49)

  • PA Digital Shaded-relief Map (p 50)

  • PA Geologic Shaded-relief Map (p 51)

  • PA Land-cover Map (p 52)

  • PA Watershed Map (pp 53)

  • Map of Counties (pp 54)

  • Map of Municipalities (pp 55)

  • Large mylar sheet with erasable markers (optional)

  • Post-it notes

  • Standard rulers for each team

  • *Optional:* small toy vehicles

• Prepare copies of the Percent in Population Change Worksheet (p 56) for each team.

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• Prepare copies of the Change in Population by County (2000-2002) pages (pp 57-58). For the most current information visit www.pasdc.hbg.psu.edu/.

• Prepare five different sets of graphs and charts along with the appropriate worksheet (pp 59-68). Each team will be given a different set of information. During the lesson each team will be asked to analyze the information and present a summary of their findings to the group.

Procedure

Part 1: Learning from Maps

The first part involves participants in exploring information about Pennsylvania through a variety of maps. Participants will define physiographic regions and how the features of each region influenced early settlements and current development patterns. Maps are provided. Additional maps and information are available from the Department of Conservation and Natural Resources, Topographic and Geologic Survey at www.dcnr.state.pa.us/topogeo.

Mountain ridges, plateaus, ravines, rivers, bogs, and farmland are all components of Pennsylvania's landscape. Landscape features can be organized and separated by land or water associations within the state. Geology and topography dictate how the landscape is classified into regions or provinces, such as the Ridge and Valley Province.

Natural resources and natural features of Pennsylvania provide the stage for building communities and development patterns in Pennsylvania. For communities to make wise decisions, it is imperative to understand the connection between people and physiographic regions. To understand the diversity of past settlements and future patterns of development, it is important to examine the features of the six distinct physiographic provinces located in Pennsylvania. Starting from the

southeast corner to the northwest corner, they are: the Atlantic Coastal Plain Province, the Piedmont Province, the New England Province, the Ridge and Valley Province, the Appalachian Plateau Province and the Central Lowlands Province.

Physiographic regions are a way to define the Earth's landforms into distinct areas based on geology and topography in a three-tiered approach of divisions, provinces and sections, first defined in the early 1900s. The basis of each region is its geology which in turn, influences the physical land forms. Other influences include water, climate, vegetation and other non-geological criteria. Each province has its own economic advantages and geologic hazards which play an important role in shaping everyday life in Pennsylvania.

1. Begin an exploration of Pennsylvania by examining the shaded relief map. The first activity is for participants to determine the size of Pennsylvania. Using a ruler and the map scale, participants determine the size and dimensions of Pennsylvania.

Pennsylvania is rectangular in shape. It is about 309 miles long and about 174 miles wide. It consists of 29 million acres of land or about 44,982 square miles. It ranks 33rd in size compared to the other states. It is 1/12 the size of Alaska and 1/6 the size of Texas.

2. Examine the digital shaded relief map and discuss the land features.

Discuss the following questions:

1. Why is it called a relief map? What does it tell us? How do you use the key?

2. Where are the flat lands, ridges, mountains, rivers?

3 .Where are the highest areas? Where are the lowest areas?

4. What are the most common features in Pennsylvania?

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5. How would you group the features so that you have five to seven defined areas?

6. Write a description of Pennsylvania land features for an advertisement.

Have participants visualize the "textures" of the relief map by taking an imaginary journey across the state using their hands (or toy vehicle). Moving from the southeast to the northwest corner, participants dramatize the following paragraph as it is read out loud.

"Begin at the Delaware River in the Atlantic Coastal Plain at Philadelphia and rise to the gently rolling hills of the Piedmont Province with its rich, fertile soils. There is a little bump over the small sections of the New England province or the northern tip of the Blue Ridge. Follow the roller-coaster Ridge and Valley Province as we cross the Susquehanna River and ascend to the high rocky Appalachian Plateau rising in the western and northern portions of the state, traveling through the Ohio River drainage basin. The journey ends at the shores of Lake Erie at the Central Lowlands Province".

3. Review the information by providing teams with a set of descriptions of the physiographic provinces and corresponding photos. Each team is to place the corresponding cards in the appropriate regions. Each team is to discuss the features of each province and how the features would influence settlement patterns. An optional activity would be to place a mylar sheet over the map and draw an outline of each region. Check the information by examining a map of the physiographic regions.

4. Discuss how the geology, water resources and physical features of land influence how Pennsylvania developed. Using Post-it notes or mylar sheets, identify the locations of three early settlements. Where were early settlements located and what role did land features have in the development of early settlements?

Discuss how the different features encourage certain activities. Flat land and rolling hills are used for farming in turn may become prime locations for industry and development. Ridges and areas of high elevation are forested and thus used for lumbering. Valleys with rich soils are used for farming, highways, industry and development. Rivers and the land next to rivers provided transportation routes and influenced industrial development because of water power and transportation. Areas with geologic value are mined and require transportation routes which historically started with rivers, to canals, to rails and highways.

5. Geology: Determine the types of geologic resources located in the different regions by examining the geologic map. Discuss how geology is important to the development of the regions. Rocks and minerals with economic value include anthracite coal, bituminous coal, limestone, Marcellus shale, slate, oil and unconsolidated rock. If possible, examine samples of the actual geologic resources and place them on the map to signify where they are located. Discuss how these resources are important to Pennsylvania. What communities developed because of a geologic resource? How did these resources influence other community development?

6. Water: Water resources in Pennsylvania are classified into eight distinct river drainage basins and 9,855 different watersheds across the state (Myers et al. 2000). Watersheds and drainage basins are defined by the direction of water flow from land into streams and then into rivers or other bodies of water. Ridges define the boundaries of watersheds.

The Stroud Water Research Center defines watersheds on their website: *"The area of land that drains into streams, lakes, estuaries or other bodies of water are known as watersheds. They are also known as drainage basins or catchments. As precipitation falls to the ground, the water is*

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pulled downhill by gravity, which causes it to flow over the landscape or infiltrate through the soil into the groundwater. Topography—the hills, valleys, and other features that define the landscape—determine the boundaries of watersheds." www.stroudcenter.org

There are six major drainage basins to identify on the watershed map. Elk and Gunpowder watersheds occupy a small area of southern Pennsylvania and are not included in the following list. Examine the watershed map. Using Post-it notes, label the major drainage basins on the shaded digital-relief map. Determine the watershed in which your community is located.

- Delaware River Drainage Basin

- Susquehanna River Drainage Basin (Chesapeake Bay)

- Ohio River Drainage Basin

- Potomac River Drainage Basin

- Great Lakes Drainage Basin (Lake Erie)

- Great Lakes Drainage Basin (Genesee River)

Pennsylvania has more than 83,000 miles of streams and rivers. Historically, rivers have been a primary influence on growth patterns in Pennsylvania. Make a list of all the uses of rivers historically and presently: drinking water, waste treatment, irrigation, transportation of goods and people, water power for mills and steam, water power to generate electricity, industrial uses, aesthetics, recreation (swimming, boating, etc.), food (fishing, gathering, hunting), water for livestock, etc.

How did rivers help shape the growth of communities in Pennsylvania? What impact did historic communities have on water quality and water quantity? What impacts do communities make on water resources today? How do they compare? What do you project will happen in the future as communities grow and more demands are placed on water resources?

7. Landcover: What covers Pennsylvania? Analyze the Land Cover Map of Pennsylvania. Discuss the information provided by the map. This is an important tool to analyze land use based on assigning colors to various types of vegetation and development. The vegetation and built environment are divided into 15 classes which fall into one of five categories: Developed, Forested Upland, Herbaceous Planted/Cultivated, Barren, Water and Wetlands. How much of Pennsylvania is forested (60 percent)? Discuss the amount of Pennsylvania that is agriculture (about 30 percent). What type of land cover is in your county? Where is developed land concentrated? What does that indicate? What do you predict this map will look like in 10 years? 20 Years? 100 years?

8. Based on the maps studied, select your favorite place to live and your favorite place to visit? Discuss your selection. How do they differ and why?

What are some of the advantages and disadvantages in living in certain regions? What characteristics of land and water would you need to consider in making choices? Discuss some physical characteristics to consider before selecting a place to buy a home: water supply, steep slopes, flood zones, stormwater runoff, landslides, road construction, sewage and waste disposal, etc.

Part 2: Studying County Population Trends

1. Do you describe Pennsylvania as urban or rural? How would you define each? What characteristics are associated with rural and urban? There are 67 counties in Pennsylvania, 48 of which are considered rural and 19 considered urban by the calculations developed by the Center for Rural Pennsylvania.

In 2003, the Center for Rural Pennsylvania (www.ruralpa.org) adopted a definition of rural and urban based on population density by dividing the total

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population by the total number of square land miles. In 2000, the population density of Pennsylvania was 274 persons per square mile. By using this method of computation, a county or school is considered rural when the number of persons per square mile is less than 274. If the calculation is more than 274 persons per square mile, then it is considered urban.

2. County population trends are changing. In 2000, there were 12.2 million people in Pennsylvania. The population of Pennsylvania has maintained a steady population for the past 10 years. However, some counties are experiencing a tremendous growth in population while others are losing population. Some county populations remain stable. Why do you think there is a difference in the population trends of different counties?

3. Which counties do you predict are growing? Which counties do you predict are declining? Provide a county map to each team. Ask participants to select three counties they predict are growing and mark them with a "+". Predict which 3 counties are declining in population and mark them with a "-". Have participants discuss and share their reasons.

4. Review the County Population Estimates and the Population Change Worksheet. Check the information on the counties you selected to determine if your response was correct. By reviewing the chart, have participants list the top eight counties that have increased in population. List the top eight counties that have decreased in population. List counties which remained the same.

5. Using the map of the counties, color the map with the following color key:

- Red for counties that have increased in population.

- Blue for counties that have decreased in population.

- Yellow for counties that have remained the same.

6. Discuss the reasons that county populations are changing. What pressures are causing population growth and decline? How does that impact the communities? What are some of the problems communities face when populations increase? What are some of the problems communities face when population decreases? How do the trends impact natural resources? What are some strategies that might help declining communities? What are some strategies that will help communities deal with tremendous growth?

7. Have participants access the U.S. Census Bureau web site at www.census.gov. Select Pennsylvania. This web site provides accurate and recent data on census information. The foundation of our American democracy is dependent on fair and equitable representation in Congress. In order to achieve accurate assessment of the numbers and location of the people, the U.S. Constitution mandates a census of the population every 10 years. The census population totals determine which states gain or lose representation in Congress. It determines the amount of state and federal funding.

The goal of the 2010 census is to count everyone only once and in the right place. Facts gathered help shape discussions for the rest of the decade about public health, neighborhood improvements, transportation, education, senior services and much more.

In 1790, the first census was taken by U.S. marshals on horseback. They counted 3.9 million people living in the United States. Census 2000 counted more than 281 million people. It is estimated that by 2010 there will be 310 million people living in the United States. Discuss how population growth will impact the communities in the United States. What ways can Pennsylvania plan for projected population changes?

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Part 3: Determining trends and patterns

Graphs and maps are located in the Annual Report on Land Use and are used with permission from the Governor's Center for Local Government Services (www.newpa.com).

1. Charts and graphs summarize data, providing a "snapshot" of information that will help visualize changes that have taken place over the past several decades. With this information, you can determine the planning goals and objectives for the future of Pennsylvania. Participants will compare and contrast data presented in the graphs and maps. Participants will answer questions to determine trends in Pennsylvania. They will apply their knowledge in making land use decisions for the future of Pennsylvania.

2. Interpreting data and using information to make decisions is an important skill. Divide participants into five teams. Each team will examine data graphs and maps about their topic, read information and answer questions. Each team will present the information to the class.

- Team One: Population Growth

- Team Two: Land Development

- Team Three: Land Cover and Agricultural Lands

- Team Four: Wetlands, Forests and Parks

- Team Five: Vehicles, Road Miles and Public Transportation

3. Provide 15 minutes for participants to answer the questions. Have each team summarize what they found out about trends in Pennsylvania land use and population.

4. What projections can you make for the future? Based on the research, what trends are positive trends for Pennsylvania? Discuss your reasons. What land uses do you want to change? How could planning protect the quality of living in Pennsylvania for the future?

Information: During the 1990s, Pennsylvania was the third-slowest growing state in the country. It grew by just 3.4 percent or 400,000 residents.

The population of 12.3 million has grown by just 0.44 percent between 2000 and 2002. This was an improvement from the 1970s and 80s when population was declining.

The startling fact is that even though the state population is barely growing, it has developed land at such a rate that it is the sixth largest "consumer" of land in the country, consuming more farmland and natural space per added resident than every state but Wyoming.

Between 1982 and 1997, Pennsylvania developed some 1.14 million acres of fields, open space and natural land. According to the Brookings Institution's *Urban and Metropolitan Policy, Back to Prosperity,* "…over those 15 years, the state consumed land at a rate equivalent to 209 acres a day, or nine acres an hour, every hour" This took place at a time when the population grew just 2.5 percent.

Pennsylvania's economy is declining. There is a hope that increased development will help the economy. At the same time, it is important to understand the importance of planning and guiding growth while protecting valuable natural resources and creating valuable and appealing places to live. Every citizen should become educated on how land choices are made and understand the consequences of land use decisions. Every citizen should become involved in shaping the future of their community. Land decisions

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today will become part of history tomorrow. Planning for the future will help determine a direction for your community and for Pennsylvania.

Assessment and Review

1. What tools are used to assess land and community changes?

2. Predict the land use trends and patterns in 10 and 25 years. What changes could occur? What will the consequences and impacts be to the environment and to wildlife?

Extension

Geospatial Information System (GIS) is an information technology that allows management of spatial information. It is a toolbox for collecting, storing and retrieving data, and transforming the information onto maps. Counties use GIS extensively to generate reports. It is important for students and other participants to become familiar with this technology. Review the Resources section of this book for additional aerial photos and data resources.

> **We must not** *only protect the countryside and save it from destruction, we must restore what has been destroyed and salvage the beauty and charm of our cities...Once our natural splendor is destroyed, it can never be recaptured. And once man can no longer walk with beauty or wonder at nature, his spirit will wither and his sustenance be wasted.*
>
> **Lyndon B. Johnson (Former U.S. President)**

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