

Maryland Environmental Literacy Partnership

High School Module Outline

Module Title: Population Growth, Urban Sprawl, Smart Growth

US Government

Class periods- 4-5 class periods

Materials Needed: Computers, printers, camera, smart growth maps, power point, excel spreadsheets, graph paper

Driving Question: How should the national, state, and local governments respond to population growth to protect the Chesapeake Bay and its resources?

Background for the Teacher: Maryland's population is growing. This population growth is placing pressures on both open space and the water quality of the Chesapeake Bay. Limiting population growth is all but impossible in a free society. The question, therefore, is how do the state and local governments implement policies that effectively use land and minimize water quality degradation. The focus of these lessons will be on the use of Smart Growth zoning laws. By the end of the lesson sequence students should be able to come up with solutions to prevent urban sprawl through land use and zoning laws.

MDK12

The student will evaluate the role of government in addressing land use and other environmental issues (3.1.2).

1. The student will analyze the roles and relationships of regions on the formation and implementation of government [policy](#) (3.1.3).

1. Analyze geographic issues and problems using geographic concepts.

2. The student will examine [regulatory agencies](#) and their social, economic, and political impact on the country, a [region](#), or on/within a [state](#) (4.1.3).

3. The student will evaluate the effectiveness of current monetary and [fiscal policy](#) on promoting full employment, [price](#) stability, and economic performance (4.1.4).

3. The student will evaluate roles and policies the government has assumed regarding public issues (1.1.3).

1. The student will explain roles and analyze strategies individuals or groups may use to initiate change in governmental [policy](#) and institutions (1.1.4).

Common Core

[CCSS.ELA-Literacy.RH.9-10.7](#) Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text.

[CCSS.ELA-Literacy.RH.9-10.9](#) Compare and contrast treatments of the same topic in several

primary and secondary sources.

CCSS.ELA-Literacy.RI.11-12.7 Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.

Context Setting Activity: Have students take out a blank sheet of paper and sketch their ideal home in 20 years. Have the students add as many details as possible and label as much as possible such as children, pets, town the home is located in. You may even choose to have the students write a letter to themselves as a 35 year old explaining what they are up to and what they are doing in life.

Investigative Questions:

- a. How has Maryland's population changed in the past 10 years and how is Urban Sprawl affecting the water quality of the Chesapeake Bay?
- b. What has your county done to address urban sprawl?
- c. How has Maryland's Smart Growth policy addressed the Chesapeake Bay and its resources?

Evidence, Artifacts, and Investigations (Lessons):

Lesson 1: Intro, Urban Sprawl, & Chesapeake Bay Issues Caused by Urban Sprawl

Lesson 2: Solving the Problems of Urban Sprawl

Lesson 3: Smart Growth-Investigation

Forming and Presenting Conclusions:

1. Ask students to complete a sprawl photojournalism project. Ask them to use cameras to take pictures of sprawl scenes in their area. Then have them write captions to accompany their photographs and create a sprawl exhibit. The captions should match the vocabulary and topics addressed in their online investigation. Their exhibit should answer:
 - a. Where does sprawl exist?
 - b. What does sprawl look like?
 - c. Is sprawl a big problem?

Student Action/Civic Engagement:

1. Write a letter to the Governor of Maryland explaining your Smart Growth plan. Use your notes, web quest research, and land use simulation recording sheet to further support your decision. Incorporate the goals of smart growth and ideas that go along with the program in your report. Rubric is provided *Teacher Resource Sheet 1: Land Use Report Rubric and Teacher Resource Sheet 2: Land Use Report Planning sheet*
2. Design a community plan using Smart Growth concepts for a particular area in your community. Use your ideal home image in the context setting activity to start out your planning. Present your ideal Smart Growth community using a powerpoint presentation.

Teacher Resource Sheet 1

Land Use Report Rubric

This is the rubric for your third marking period project. Make sure you check off as you write your report if you have included all the information I require.

Required items	Points earned	checklist
Opening statement of problems with land use in Maryland	/5	
Your goals for land use include Smart Growth	/10	
How will use balance environmentalists and land developers concerns	/10	
Rank the areas of least and most concern for Maryland and why/where money should be spent	/10	
Explain where and what Smart Growth initiatives should take place	/20	
Conclusion	/5	
Spelling/Grammar/organization	/10	

Total Points: /70

Teacher Resource Sheet 2: Land Use Report Planning Sheet

Land Use Report Planning Sheet

Report planning sheet: These are the required items for your report you may provide other information and graphics at the end.

Paragraph 1-Opening statement of problems/concerns with land use in the state of Maryland (Mention specific regions and their problems)

Paragraph 2-Write your goals for Maryland land use using the Smart Growth article as a reference. You should have no more than two goals.

Paragraph 3-Tell the governor how you will strike a balance between environmental concerns that you read about in the Urban Sprawl article and land development that is necessary for economic growth

Paragraph 4- Rank your top 3 areas of concern for the Governor. Suggest to him where you would budget the states money and why.

Paragraph 5/6- Solutions:

1. What do you think the state should do to solve the problems associated with land use?
2. What Smart Growth Initiatives would you suggest?

Paragraph 7- End your report with a conclusion/wrap up of your plan for land use in Maryland.

Attachments optional: Provide graphics or additional resources if needed

Lesson One: Intro, Urban Sprawl, & Chesapeake Bay Issues Caused by Urban Sprawl

Driving Question:

How should the national, state, and local governments respond to population growth to protect the Chesapeake Bay and its resources?

Investigative Questions:

How has Maryland's population changed in the past 10 years and how is Urban Sprawl affecting the water quality of the Chesapeake Bay?

Background for teacher: Maryland's population is growing. This population growth is placing pressures on both open space and the water quality of the Chesapeake Bay. Limiting population growth is all but impossible in a free society. The question, therefore, is how do the state and local governments implement policies that effectively use land and minimize water quality degradation. The focus of these lessons will be on the use of Smart Growth zoning laws. An interesting phenomenon about smart growth is that it conflicts with the traditional American dream of a Suburban house, with a two car garage, a backyard, dog, and two children. This lesson sequence begins with an activity to see whether or not that "dream" has changed.

Context Setting Activity: Have students take out a blank sheet of paper and sketch their ideal home in 20 years. Have the students add as many details as possible and label as much as possible such as children, pets, town the home is located in. You may even choose to have the students write a letter to themselves as a 35 year old explaining what they are up to and what they are doing in life.

Prior Knowledge: Have the students participate in a Think pair share activity with the following questions: Record answers on the board

1. Where is population in Maryland increasing and how can you tell?
2. How does population growth impact the environment?
3. Who should be responsible for protecting the environment from Urban Sprawl.

Background Knowledge for Students:

Urban Sprawl

The following website has historical views of Baltimore and Urban Sprawl

http://science1.nasa.gov/science-news/science-at-nasa/2002/11oct_sprawl/

Evidence, Artifacts, and Investigations

Distribute copies of the Excel Spread Sheet titled Population Density 2000_2010. Explain that this spread sheet has the population figures for each county according to the 2000 and 2010 census. The spreadsheet also displays square mileage of each county which allows the students to calculate density which is population/sq. mile.

Break up the class into small groups. Assign each group the task of graphing out the data such as

- Population of each county most to least
- Area of each county largest to smallest
- Highest Density most to least
- population change greatest to smallest
- Density change most to least

There may be other possibilities as well. Choose one student at random to present the data to the class.

* If you have access to a computer lab you may choose to have the students create the graphs in Microsoft Excel. This may take a bit of explaining how to create the graphs but it is also a wonderful technology skill that each student should have. Furthermore, the graphs turn out professional and would be nice articles to display on bulletin boards.

Reading extension

Distribute the article “paving the Bay” from the Maryland Department of Natural Resources
<http://www.dnr.state.md.us/education/envirothon/impervious.html>

This article explains how urban sprawl and impervious surfaces degrade the water quality of the Chesapeake Bay. This article can be assigned as homework if there is a need to save class time.

Closure/Exit Ticket

Ask the students to write down 1-3 ideas that would help reduce the amount of urban sprawl and impervious surfaces.

Extension Activity

The following is an interactive map that displays impervious surfaces. Ask the students to predict where they expect to see the majority of impervious surfaces

Impervious Surface Interactive Map

<http://mdimap.towson.edu/streamhealth>

Additional Resources:

The following are internet resources that can be used to enhance the knowledge of both the teacher

and student.

Maryland Population Projections

http://planning.maryland.gov/msdc/S3_Projection.shtml

Maryland Population 2010 vs 2050

http://planning.maryland.gov/msdc/population_density/density_mdstcnty_2000-10.xls

http://planning.maryland.gov/msdc/popproj/Population_March27_2012_PR.xls

Urban Sprawl effects on water quality

<http://www.epa.gov/greenkit/toolwq.htm>

Urban Sprawl: Bay Journal Article:

http://www.bayjournal.com/article/ignoring_harmful_sprawl_will_not_make_it_go_away

http://www.bayjournal.com/article/resac_maps_are_suitable_for_monitoring_urban_sprawl

Maryland Historical Census Maps

<http://www.censusfinder.com/mapmd.htm>

Maryland Census Data Maps

http://planning.maryland.gov/MSDC/Census/Cen2010/PopChg_byRace_00to10/PopChg_byRace_00to10.shtml

storm water calculator

<http://www.epa.gov/nrmrl/wswrd/wq/models/swc/>

storm water ratios

<https://engineering.purdue.edu/SafeWater/watershed/landuse.html>

Impervious Surface Interactive Map

<http://mdimap.towson.edu/streamhealth/>

Agricultural Data by county

<http://mda.maryland.gov/Pages/County-Agricultural-and-Land-Use-Information.aspx>

Lesson Two: Solving the Problems of Urban Sprawl

Driving Question:

How should the national, state, and local governments respond to population growth to protect the Chesapeake Bay and its resources?

Investigating Question:

What has your county done to address urban sprawl?

Prior Knowledge:

1. Conduct a class discussion in which students use prior knowledge to generate a list of ways each of the following groups might help solve the problems of urban sprawl: private citizens, private business owners, and county government officials. Use the *Student Resource Sheet 1: Brainstorm*, to create a visual representing their lists.
2. Distribute a historical map of your county to students ask them to complete a KWL while looking at the map. Distribute the *Student Resource Sheet 2* to help facilitate the KWL activity.

Activity:

1. Ask students to conduct an investigation into how their county addresses urban sprawl. Students will need computer lab access and websites that pertain to their county in order to investigate the questions on the *Student Resource Sheet 3* labeled, Local Urban Sprawl Investigation.

Resources for Lesson:

Interactive Maps of Maryland:

<http://planning.maryland.gov/OurProducts/iMaps.shtml>

Harford County Links:

<http://www.harfordcountymd.gov/planningzoning/>

<http://www.harfordcountymd.gov/PlanningZoning/Download/1303-406.pdf>

Montgomery County Link:

http://www.montgomeryplanning.org/community/plan_areas/I270_corridor/master_plans/germantownmp0789/

Student Resource Sheet 1

Brainstorm

Private Business Owners

Private Citizens

County Government Officials

Student Resource Sheet 2

K

W

L

What do we think we know?	What questions do we still have?	What have we learned?
<ul style="list-style-type: none"> ● What do you see in this image? ● What is happening? ● When do you think this map was created? ● Why do you think someone created this document? ● How did you come up with your answer? 	<p>How will we explore our questions?</p>	<p>What questions remain?</p>

Student Resource Sheet 3

Local Urban Sprawl Investigation

Directions: Using the websites given to you by your teacher, and other resources found online, answer the questions below.

1. Does your county have a ‘master plan’ to address urban sprawl? If so, what components of future growth does the plan address?
2. What part of your county has the most population density?
3. Where do you see the most sprawl your county?
4. In what ways does your county use zoning to shape community development?
5. What areas of your county are preserved? Why?
6. What areas of your county are considered open space?
7. What towns within your county have the most critical environmental areas?
8. Does your county have mass transit? If so, what kind? How does this impact urban sprawl?
9. Does your county have a five or ten year plan? If so, what is addressed in these plans?
10. Do you think urban sprawl is a problem for your county? Why or why not?

Lesson Three: Smart Growth Investigation

Driving Question:

How should the national, state, and local governments respond to population growth to protect the Chesapeake Bay and its resources?

Investigation Question:

How has Maryland’s Smart Growth policy addressed the Chesapeake Bay and its resources?

Prior Knowledge:

1. Discuss the concept of an “ideal” community. Challenge students to develop an ideal community while keeping the following concepts in mind:
 - A community should have services that meet the educational, health, occupational, safety, and recreational needs of the people who live there.
 - Care should be taken to minimize environmental impact and maintain existing ecosystems.
 - Interactions between residential areas and business areas should be minimal, though all areas should be easily accessible.
2. Have students read an article about Smart growth or teacher present a power point. Use resource links below for information about Smart growth.

Activity:

1. Conduct a land use simulation using the Smart Growth maps or a map of Maryland. See *Student Resource Sheet 4: Land use Simulation* worksheet below. Record your placement of land use terms.
2. Students complete *Student Resource Sheet 5: Land Use terms* chart as you place terms on the Smart growth maps.

Resources for lesson:

<http://www.smartgrowthamerica.org/what-is-smart-growth>

<http://planning.maryland.gov/OurWork/SmartGrowth.shtml>

<http://smartgrowth.umd.edu/smartgrowthinmaryland.html>

<http://www.mdp.state.md.us/>

<http://planning.maryland.gov/ourproducts/downloads/generalzoning/MarylandGeneralizedZoning012012.pdf>

Student Resource Sheet 4

Land use simulation

You all are state congressmen and the Maryland Department of Natural Resources is asking you to decide how Maryland is going to curb urban sprawl and initiative the Smart Growth program. Remember the goals of smart growth and the problems associated with urban sprawl. It won't be an easy job but you must study the map of Maryland and decided what areas you are going to preserve and what areas you will allow land developers to build. **Basically you must strike a balance between**

Preservation	resources to protect the long-term quality of life for residents.	
Open Space	Acquires park land, forests, natural, scenic, and cultural resources for public use. Some of the projects include ball parks, playgrounds, tennis courts, fishing and hunting areas, and many more.	
Critical Environmental Areas	The area around all water and wetlands of the Chesapeake Bay that may be in danger of pollution, land usage, or disturbances of natural ecosystems.	
Sprawl	Spreading out of development over rural land near cities and urban areas.	
Smart Growth	A government program to protect green space that could be replaced by strip malls and subdivisions, creating poor air quality and water pollution, while older communities and schools are abandoned.	
Land Use	Protecting land while trying to understand the nature and extent of human interaction with the earth's surface.	
Historic Preservation	Preserve the scenic quality and natural environment of historic landscapes, buildings and roads.	
Chesapeake Bay Watershed	The total land area that drains water into a given river, lake, estuary or other body of water.	

Infrastructure	The basic facilities of a city, such as paved streets and sidewalks, water pipes, sewers, bridges, and public buildings.	
Mass Transit	Systems such as subways that are used to transport a large number of people.	
Critical Areas	The land within 1,000 feet of tidal waters or tidal wetlands immediately surrounding the Bay and its tributaries has the greatest potential to affect water quality and wildlife habitat.	
Run-off	When rain or snow falls onto the earth, it just doesn't sit there -- it starts moving according to the laws of gravity. It is important to Keep rivers and lakes full of water, but it also changes the landscape by the action of erosion or carries pollution to bodies of water.	