



## **Urban Development and the Environment**

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This curriculum unit is recommended for AP Human Geography

**Keywords:** Urban Development, Urban Planning, Cities, Urban Land Use, Environment, Geography, Christallers Central Place Theory

**Teaching Standards:** See [Appendix 1](#) for teaching standards addressed in this unit.

**Synopsis:** The topic that my AP Human Geography unit is centered around is: “the role of climate change and environmental abuses in shaping the human landscapes on Earth.” The goal in AP Human Geography is for students to become more geoliterate, more engaged in contemporary global issues, and more informed about multicultural viewpoints. They develop skills in approaching problems geographically, using maps and geospatial technologies, thinking critically about texts and graphic images, interpreting cultural landscapes, and applying geographic concepts such as scale, region, diffusion, interdependence, and spatial interaction, among others. This curriculum unit addresses three areas are the study of urban patterns. First, students will gain skills that will help them keep all of the urban patterns straight. Second, students will gain a deeper understanding of how cities function as a single entity while sharing common patterns and concerns with nearby urban areas. Third, students will develop an urban plan where they combine patterns, processes, and environmental concerns that affect all cities. This curriculum unit will help students see geography as a discipline relevant to the world in which they live; as a source of ideas for identifying, clarifying, and solving problems at various scales; and as a key component of building global citizenship and environmental stewardship.

*I plan to teach this unit during the coming year to 50 students in AP Human Geography*

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## Urban Development and the Environment

by Tamara L. Babulski

### *Introduction*

Independence High School is one of thirty-two public high schools within the Charlotte-Mecklenburg School District. This school began in 1967 as the only high school in Mint Hill, a suburb of Charlotte. It is a high performing high school within the state, earning the 2011 Broad Prize for excellence in public education. The philosophy of Independence High School is: 1) to encourage and support the development of tolerant, productive, and creative individuals. 2) to prepare students for employment, responsible participation in their community, and satisfying lives in a changing and diverse society. And 3) to help students develop a sense of worth in order to function successfully as individuals and in group interactions. <sup>i</sup> The goals of Independence High School are: 1) to offer quality educational experiences that recognize the unique and diverse learning styles, backgrounds, and needs of all students. 2) to implement a curriculum that requires all students to master fundamental skills. 3) to provide students with problem solving and critical thinking skills needed for successful decision making. 4) to foster collaborative relationships with parents and community agencies to support students' learning and well-being. 5) to treat students in a fair and equitable manner in all aspects of our school environment: in discipline, in praise, in opportunities to participate, in expectations, and in all responsibilities for their own learning. 6) to incorporate technology into all instructional programs to make learning more interesting to the students and prepare them to use these technologies in their everyday lives. 7) to provide students with skills needed to be college and/or career ready for graduation. <sup>ii</sup>

Each year Independence High School has a theme for the year. Each theme reflects the focus of the administration and the teachers within their classroom. The theme for the current school year is "Connections". Connecting the subjects to the students. Connecting students to the school. Connecting teachers and the administration to the community of Mint Hill. Connecting all stakeholders to the idea that Independence High School will work to lead all students to realize their potential. Connections are proven through simple and complex measures. Each teacher makes strides daily to connect their current subject and daily topic to not only their students' lives but to the world as an entity.

I am a twenty-six-year veteran of public education. I currently teach World History, Latin American Studies and AP Human Geography. This curriculum unit relates to AP Human Geography; although, parts of it can be tweaked to apply in World History. I reference points that apply to World History as they occur during the unit. College Board considers AP Human Geography. This means that it is accessible to all students at all levels. Many schools have AP Human Geography as a strictly ninth grade course. At Independence High School AP Human Geography is open to all grade levels and all academic levels. Currently, I teach freshman through seniors. Approximately half of my current students have never taken an AP class before mine. In response to that, this curriculum unit has the new AP student in mind

Independence High School currently has almost twenty-three hundred students. The student body evenly divides between the classes, with the freshman class being the largest class. Racially, Independence High is favored between black and Hispanic, two to one over the white population. Independence is in its second year of working with Equal Opportunity Schools (EOS), which is actively centered around encouraging underrepresented student populations into signing up for

honors and AP classes. Through EOS the AP population of Independence High School has doubled. This presents an interesting challenge in that many students now enrolled in AP have never taken challenging classes before. To address this challenge Independence has created a focus group just for AP teachers to help them meet the needs of their various students.

AP classes have been a mainstay of public high schools for over twenty-five years. “The Advanced Placement Program® (AP) enables willing and academically prepared students to pursue college-level studies while still in high school. The program consists of college-level courses developed by the AP Program that high schools can choose to offer, and corresponding exams that are administered once a year.”<sup>iii</sup> Students that enroll in AP classes understand that they are expected by the school to complete the entire program and take the College Board exam at the end of the year. AP Human Geography in particular “...is an introductory college-level human geography course. Students cultivate their understanding of human geography through data and geographic analyses as they explore topics like patterns and spatial organization, human impacts and interactions with their environment, and spatial processes and societal changes.”<sup>iv</sup>

Many students at Independence High School take more than one AP class at a time. Therefore, being able to balance lessons to accommodate the needs of veteran and new AP students can be challenging. The College Board, in response to many concerns teachers have of reaching students new to AP, has developed a new curriculum approach that encompasses progress checks and online resources.

The concepts in AP Human Geography divide into seven units: 1) thinking geographically, 2) population and migration patterns and processes, 3) cultural patterns and processes, 4) political patterns and processes, 5) agriculture and rural land-use patterns and processes, 6) cities and urban land-use patterns and processes, and 7) industrial and economic development patterns and processes. In addition to these seven overarching units, AP Human Geography focuses on five skills: 1) concepts and processes, 2) spatial relationships, 3) data analysis, 4) source analysis, 5) scale analysis.<sup>v</sup> The curriculum unit that I have developed addresses Unit Six on cities and urban land use and has a focus on each of the skills highlighted by the College Board.

### *Rationale*

“AP Human Geography is an introductory college-level human geography course. Students cultivate their understanding of human geography through data and geographic analyses as they explore topics like patterns and spatial organization, human impacts and interactions with their environment, and spatial processes and societal changes.”<sup>vi</sup> Many students think that AP classes are only there for the ultra-smart students and that if they do not have an A average then they should not be anywhere near an advanced class. I am here to remind those individuals that AP classes are for anyone that has the capability to handle a challenge. Geography has been long-overlooked as a necessary skill that all citizens should have a familiarity with in order to be productive members of society. “Everywhere the world is alive, awaiting exploration by those who prefer, if only at intervals, real reality to virtual reality. And as the wonders of modern technology, bear in mind that a sidewalk weed, and a protozoan are each more complex than any device yet invented by humanity.”<sup>vii</sup>

Within unit six, students study the various types urban patterns and how they have an influence on the environment and the people living with that area. Key concepts in unit six are: hierarchies of cities, world cities, international characteristics of cities, models of urban structure, Christaller's central place theory, primate cities, and urban problems such as pollution, urban sprawl, and food deserts.<sup>viii</sup> It has been my experience that students will occasionally struggle with ways to keep all of the urban patterns straight. In addition, they struggle with how to understand why certain urban issues are more prevalent in developed nations and less prevalent in developed nations. And yet, understanding that being a developed nation does mean you are free from societal crippling issues.

This curriculum unit addresses three concerns that students have when studying urban patterns. First, students will gain skills that will help them keep all of the urban patterns straight. Second, students will gain a deeper understanding of how cities function as a single entity while sharing common patterns and concerns with nearby urban areas. Third, students will develop an urban plan where they combine patterns, processes, and environmental concerns that affect all cities. The culminating project for this curriculum unit a cooperative, interactive presentation that collaborates with AP Environmental Science.

### *Content Research*

The first step in executing this curriculum unit effectively is to have a very firm grasp of the key concepts embedded at the heart of the lesson. The heart of this unit explores urban development and its influence on the environment and in turn its impact on climate. When you look at climate and urban areas you will notice that there is a symbiotic relationship between them. Climate is defined as: "The composite or generally prevailing weather conditions or a region, such as temperature, air pressure, humidity, precipitation, sunshine, cloudiness, and winds, throughout the year, averaged over a series of years."<sup>ix</sup>The concept of climate gets us started but we need to dive much deeper to truly have a grasp of what is happening with urban development. Climate change is a very real concept that not only impacts students' lives outside of school, but it is an integral part of this curriculum unit. As Mike Hulme stated in a book on climate change: "Human beings are shaped by climate and cultures not of their own choosing and yet human projects and innovations decisively alter both their climactic and their cultural environments."<sup>x</sup>

It's very important for you, as the educator of AP Human Geography, to understand not only the symbiotic relationship between urban sprawl and climate change, but also how geography and climate are intertwined. This entails that an understanding of climate change is important to be able to fully explain the codependent relationship between cultures, geography, and the environment. Mike Hulme explains it best: "...climate and culture come together and find joint expression in the idea of landscape."<sup>xi</sup> The Netherlands has dedicated years to studying this exact relationship. The journal *Resources, Conservation, and Recycling* has many fantastic articles to help explain how the different parts work together. "The relationship between climate and city is reciprocal. The climate influences the ways in which the city space is being used and the climate performance and needs of buildings."<sup>xii</sup> Urban development is a key concept to not only understand Unit 6 of the CED, but it is essential knowledge that our students will need to become well-informed citizens in the age of climactic challenges. Cities "...they are fragile entities vulnerable to the stresses brought about by climate change, because the people living in cities rely on them with food, water, and energy."<sup>xiii</sup>In order to understand why urban issues persist in

the United States I assign a book study to my students. My students read *Palaces for the People* by Eric Klinenberg. “Like all cities, Chicago is a heat island, with paved roads and metallic buildings that attract the sun’s warmth and heavy pollution that traps it.”<sup>xiv</sup>.

So, the question begging for an answer is – if people are aware that major cities are heat islands and that urban development if not controlled exacerbates the problem – then why do people persist in creating urban areas that amplify the problem? Ingegård Eliasson answers this question: “Most researchers agree on the fact that, in spite of available knowledge about the climate and some good examples of climactic design, the impact in the urban planning process is usually low”<sup>xv</sup> One of the main goals of this lesson plan is to impress upon students the importance of the citizens’ voice in the planning of urban areas. The culminating project of this unit is the creation of an urban plan for the local town of Mint Hill, North Carolina. This project is explained fully in Appendix One.

When the study of climate, geography, and culture are combined, the topic of global warming and the greenhouse effect must also be considered. To begin with, greenhouse gases are important to the survival of the Earth. “Greenhouse gases are important in keeping the Earth warm and comfortable, but a change in the amount of these gases may lead to serious consequences.”<sup>xvi</sup> So, greenhouse gases are important for our survival. That has never been in doubt. The fact is that increasing greenhouse gas concentration due to human activities – the burning of fossil fuels for energy, land use, and deforestation – has warmed the planet and will continue to warm the planet in the future. This continues to be a big debate on who or what has led to this issue. “The controversy surrounding the greenhouse effect and global warming was not about the nature of the greenhouse effect – the mechanism was an established fact. The controversy continued over the extent of the warming.”<sup>xvii</sup> Warming the planet has widely varying, but generally negative effects, on all human and physical systems.

“One of economic geography’s primary goals is to explain or make sense of the land-use patterns we see on the Earth’s surface... all regions are not equal, and the spatial arrangement of economic activities is not random; it is the result of decisions made by individuals, small businesses, multinational corporations, and governments.”<sup>xviii</sup> “According to Canada’s Global News, ‘We all live in a bubble.’<sup>xix</sup> When I explain this to my students, I start off with their immediate surroundings of the school. This is a small bubble that they are familiar with. The school environment is the jumping point for understanding that their community is another bubble that they exist in.

### *General Teaching Strategies*

Janell Cox in an article at TeachHub.com states that “students learn best when they are given multiple facets... Scientists believe that when children use all of their senses it helps the brain create pathways that make it easier and quicker to retain information.”<sup>xx</sup> AP Human Geography, as a gateway course, is the perfect opportunity to show students how fun and engaging AP can be. The unit six pacing guide has the assumption of 90-minute block classes that meet on alternating days for the year. For example, week one would meet Monday, Wednesday, Friday and week two would meet Tuesday, Thursday. Keeping that pace in mind, unit six will be completed in 7-9 class sessions. Incorporated throughout the unit and in the final project are hands-on activities. The culminating project can be completed without the

collaboration of AP Earth and Environmental Science. The culminating project described within this curriculum unit is completed after the AP exam has occurred. By doing this, students have a chance to incorporate knowledge they've acquired with a real-world problem and are given an opportunity to voice their opinion to members of the community's town council. Prior to unit six students study agriculture and rural land use patterns. This knowledge of how agriculture changes the Earth's landscape helps the students relate to those issues in an urban setting.

### Day One

#### Mega and Meta Cities

Day One begins with a student- focused definition of megacities and metacities. When I first mention the concept of Megacities, I ask my students to name three. Inevitably, one of the first places they will list is New York City. "Tokyo is the world's biggest metropolitan region, while Shanghai has the world's biggest city legitimate populace"<sup>xxi</sup>. My students are usually shocked to learn that New York City is not considered one of the top five megacities in the world. "About half of the world's population now lives in urban areas because of the opportunity for a better quality of life. Many of these urban centers are expanding rapidly, leading to the growth of megacities, which are defined as metropolitan areas with populations exceeding 10 million inhabitants."<sup>xxii</sup> Understanding the ecological footprint of large urban areas is important for students to understand as they begin this study connecting large urban areas and environmentalism. "The term "metacity" was introduced by the United Nations as a way to capture the increasing size of the largest urban aggregations on the planet." A meta city is "...a heterogeneous, dynamic urban region composed of multiple dense centers, intervening suburbs, embedded green spaces, and diffuse boundaries between traditional cities, suburbs, and exurbs."<sup>xxiv</sup> Knowing what a metacity is is a critical part to the culminating project of this unit. Students will create a metacity plan for Mint Hill (the town surrounding Independence High School). To help them wrap their brains around this concept I show them what Baltimore Maryland has done. "Baltimore as a city-suburban-exurban system is surely a metacity, with growth, shrinkage, economic and demographic shifts occurring in different patches across the five county metropolitan area. In other words, a metacity and various kinds of meta-ecology share important dynamic features."<sup>xxv</sup>

#### Core, Periphery, Semi-periphery countries

Countries of the world split into three basic groups: Core, Periphery, or Semi-Periphery. A core country is a strong state economically, politically, and technologically. The United States is a core country. A Periphery country is a weak state economically, politically, and technologically. Many countries in Africa (outside of South Africa) fall into this category. A Semi-Periphery country falls between the core and the periphery. These countries are growing technologically. They are also improving their economies and have relatively stable governments. Mexico is an example of a Semi-Periphery country. The economic and technological pulse of a nation are great indicators of whether or not a country has the capabilities to adequately deal with environmental issues. For example, periphery countries are used as manufacturing sites and "back-door" offices for core countries because the labor is usually cheap and government regulations are typically lax. These places will have environmental issues but will not have the technology and organization necessary to help combat it. Therefore, a study of how countries

combat environmental issues should concentrate on core countries and their policies. Students will therefore be tasked with the assignment of researching a core country and its influence on periphery and semi-periphery countries. Students will report back their findings and begin to develop a plan on how to raise global awareness of pollution and the increasing presence of greenhouse gasses and their impact on all countries. The widely recognized model of the relationship between Core, Periphery, and Semi-Periphery countries is in Figure 1. This model is Wallerstein's World System Theory Model. It explains the interdependency between nations.

### Day Two

#### Similarities and differences between cities

No two cities are the same. Although, as my students quickly learn, cities learn from each other. For example, Charlotte, North Carolina has copied quite a few ideas from Atlanta, Georgia. Knowing this fact, my students will choose a city that is comparable in size to Mint Hill to use as their template for the metacity they create. One they pick a city they would like to use as a template they create a Venn Diagram (see Figure 2) to assist them with not only finding where all of the similarities lie; but to also find what the positive and negative characteristics of both cities are.

#### Christaller's Central Place Theory

One critical piece of the puzzle that students must have a firm grasp of is Christaller's Central Place Theory. Walter Christaller was a geographer in Germany in who, in the 1930s, studied the pattern that exists within and between cities. "This groundbreaking theory was the foundation of the study of cities as systems of cities, rather than simple hierarchies or single entities."<sup>xxvi</sup> His research became the foundation of understanding that cities are not sole entities but are interconnected with all surrounding areas. The model that Christaller created is in Figure 3.

### Day Three

#### Rank-size rule, Primate city, gravity within the city

"Pick any large area. It will likely contain many small cities, a lesser number of medium-size cities, and but few large cities."<sup>xxvii</sup> Rank-size rule and gravity are part of Christaller's Central Place Theory. Urban centers are proof that Christaller's theory is reality. People prefer to travel to places close by. People are creatures of habit frequent the same few places – this is 'gravity' within a city. Traveling the same places repeatedly wears on the environment. Thus, Christaller's Central Place Theory gives geographers an insight into how urban areas interact with the environment. This concept is a major issue students consider as they create their building proposal. On day three, students consider how rank-size rule and gravity influence how big a city will grow and its pull on surrounding areas. In addition, students research primate cities and compare them to Mint Hill, analyzing similarities and differences. "A primate city is a major city that works as the financial, political, and population center of a country and is not rivaled in any of these aspects by any other city in that country."<sup>xxviii</sup> London and Paris are examples of Primate Cities. There are no primate cities in the United States.

## Urban models – strengths and weaknesses of each

There are three urban models that students will center their analyses around: Hoyt's Sector Model, Multiple Nuclei Model, and the Concentric Zone Model. These models are highlighted in Figure 4. The purpose of studying these is to understand how people have manipulated the environment to suit their needs. The three models that are focused on are the Hoyt Sector Model, Multiple Nuclei Model, and the Concentric Zone Model. The organization of high-density urban areas and greenspaces are different for each. Students apply their knowledge of these models to the country they are studying to determine which model best fits their capital. Because all three models handle greenspaces differently, students can analyze which model, in their opinion, does the best job of tackling environmental issues.

### Day Four

Comparative case study of local cities/towns.

At day four, students are ready to delve deeper into the creation of an urban plan for Mint Hill. Students write a synopsis of the city they have been comparing to Mint Hill. In addition, students create a rough draft and outline of the plan they will create. I plan to have the Charlotte city planner and a Mint Hill town commissioner to speak to my students about the importance of a well-developed city plan and everything that must be considered when creating one. A topic I want to make sure my students hear about are the ongoing issues with medium and high density housing. Students will lead a Socratic Seminar on the book *Palaces for the People*. I want students to see connections between a city's infrastructure, the environment, and urban areas.

### Day Five

Infrastructure, urban sustainability, and food deserts are the focus of this lesson. There are some really great drone videos that fly over cities like Charlotte and Chicago. In addition to watching these videos students look at how Charlotte has changed over the years. The Charlotte Observer put out a website in 2018 that allows the viewer to look side-by-side at how Charlotte has changed since 1978. Through a split screen view, students follow the path that Charlotte took as it urbanized. Thirdly, students create a GIS map with three overlays. The first layer is a city map of Charlotte. The second layer shows the locations of two chain grocery stores. The third layer shows the locations of convenience stores and two fast food chains. The purpose is to allow students to observe where food deserts are present in the area. Students should be able to draw a connection between high socioeconomic areas and low socioeconomic areas and food deserts. Students should also see a correlation between types of urban development and food deserts.

### Day Six

At this point, students should have a firm grasp of urban development and the disparities between socio-economics and urban development. Today adds another layer to their understanding. Environmental issues such as pollution and sanitation are today's focus. The lesson begins with an analysis of their own environmental footprint. Students will go to



footprintcalculator.org. There they will take a short survey that identifies the extent of their influence on the environment. Students will create a survey to gain a snapshot of the environmental footprint of Independence High School. After students develop their survey they will go around the school, seeking answers from an equal number of students and faculty. To accomplish this, students pair up and survey five students and five faculty members. They will bring the results back to the classroom and create a report on the footprint of the school that will be displayed on a bulletin board in the common area. Students will create an environmental footprint of the surrounding area by examining instances of gentrification, squatter settlements, and suburban sprawl. Again, students will partner up and create a photo-journal of Mint Hill. Combining the three results, students will write an analysis of where Charlotte and Mint Hill are and where they need to be to reduce stress on the environment. This analysis is an integral part of their final product for the unit.

### Day Seven

This is project day. Students gather together with their partner to put together a sustainability project. They will use their survey results, their photo-journal, and their new knowledge of urban development and its impact on the environment to help them design a plan for a community within Mint Hill that is environmentally friendly while addressing the needs of a growing town. Students use their knowledge of urban models and climate science to create a plan for the future of Mint Hill. The models they create will be both written and 3-D. Each pair of students will have a model of their new community that considers the influence of Christallers Central Place Theory and environmental concerns they have identified.

### Day Eight

#### Present sustainability project

Students will present their sustainability projects to a panel that consists of teachers, administrators, community volunteers, and at least one town commissioner. Their projects consist of three parts. Part One, a physical model of their community. Part Two, a detailed analysis of their survey data. Part Three, a written report on the environmental impact, both positive and negative, of their planned community. In addition to presenting to the panel of community stakeholders, students will analyze each other on the thoroughness of their presentations. My plan is to give students the chance to display their masterpieces within town hall.

### Day Nine

#### Unit assessment

On day nine, students will demonstrate their mastery of the material through a combined assessment comprised of three parts. One third of the assessment is the peer and community stakeholder critique of the sustainability projects. The second third is an assessment of the unit itself. The last third is an FRQ (Free Response Question) on the connection between urban

development and the environment. An additional assessment occurs later in the year when students create a tri-fold display that connects urban development, climate science, and their outside reading *Palaces For The People*.

## Appendix 1

### AP Human Geography Course

“AP Human Geography is an introductory college-level human geography course. Students cultivate their understanding of human geography through data and geographic analyses as they explore topics like patterns and spatial organization, human impacts and interactions with their environment, and spatial processes and societal changes.”<sup>xxix</sup> AP Human Geography is divided into seven units. The seven units are as follows:

Unit 1 – Thinking Geographically. This unit is an in-depth dive into maps and the information they relay. Students study all of the various types of maps that can be studied, such as Choropleth, Isolinear, and Dot. Students also brush up on their geographical skills with concepts such as Site and Situation, Relative and Absolute Location, and Latitude and Longitude.

Unit 2 – Population and Migration Patterns and Processes. This unit delves into how geography influences where and how people develop. Topics such as Migration, Population Pyramids, and the Demographic Transition Model are examined. During this unit, students are assigned a country that they are going to follow throughout the year. This country is a template for skills and concepts necessary for success. It is in Unit 2 that students are introduced to the concept of environmentalism. In this instance, it is in direct result of migration patterns.

Unit 3 – Cultural Patterns and Processes. Culture is one of the most popular topics that students study. Here, students look at Diffusion, Cultural Patterns and Cultural Landscapes. Studied within this unit is language, religion, and social mores. Students use the country they are studying to create, plan, and execute a culture fair that highlights the places they are researching. Environmentalism is brought up again, this time in the context of how different cultures view the environment.

Unit 4 – Political Patterns and Processes. Governments and sovereignty issues are studied. Centrifugal and Centripetal forces are analyzed. “The theory of centripetal and centrifugal forces is associated with political geographer Richard Hartshorne. He argued that the integration of a state’s geographical area involved two competing forces. Centrifugal forces that pull people apart, and centripetal forces that bring people together.”<sup>xxx</sup> In other words, students look at how politics pulls people apart and brings the together to tackle common issues.

Unit 5 – Agricultural and Urban Land-Use Patterns and Processes. Women in agriculture, the first, second and third agricultural revolutions, and the Von Thunen Model (see Figure 5) are discussed. The Von Thunen model was developed in the 19<sup>th</sup> century and was developed to create the perfect model for goods distribution between rural and urban areas. Even though societies are no longer designed this way, his model is used to demonstrate the relationship between rural and urban areas.

### Unit 6 – Cities and Urban Land-Use Patterns and Processes

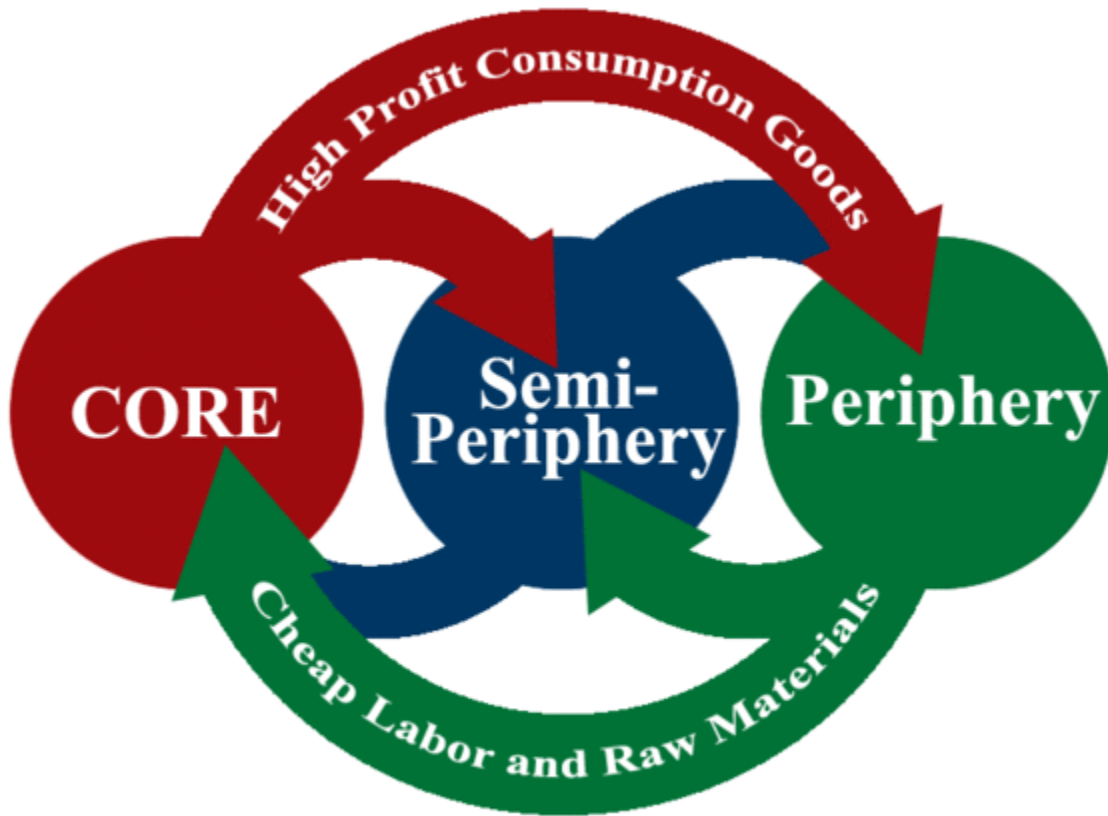
The culminating project of this lesson plan is most closely linked to this unit than others, though topics within the CU can be plugged into all of the units. Density, land use, infrastructure and sustainability are discussed in this unit. Challenges facing urban areas are one of the focal points of my curriculum unit.

Unit 7 – Industrial and Economic Development Patterns and Processes. Industrialization, economic sectors, trade and the world economy, and sustainability are the focal points of this unit. Industrialization and sustainability mirror nicely topics within unit 6 and are great topics for discussion with the sustainability project. Interwoven within these seven units are skills that are critical to a successful completion of the course and a coveted score of 4 or 5 on the AP Human Geography national test. These skills are:

1. Concepts and Processes
2. Spatial Relationships
3. Data Analysis
4. Source Analysis
5. Scale Analysis

**Appendix 2: Figures**

Figure 1: Model of Core-Periphery-Semi periphery:



**Wallerstein's World System Theory Model**

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Figure 2: Venn diagram

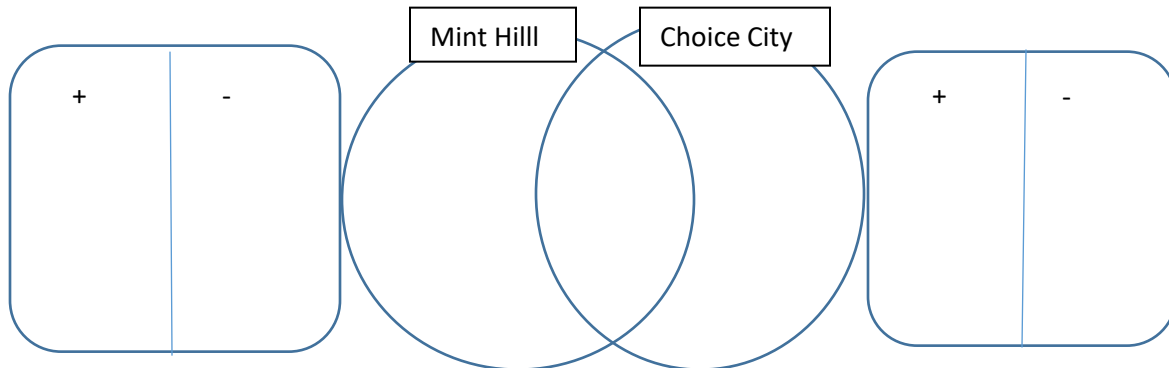


Figure 3 : Christaller's Central Place Theory

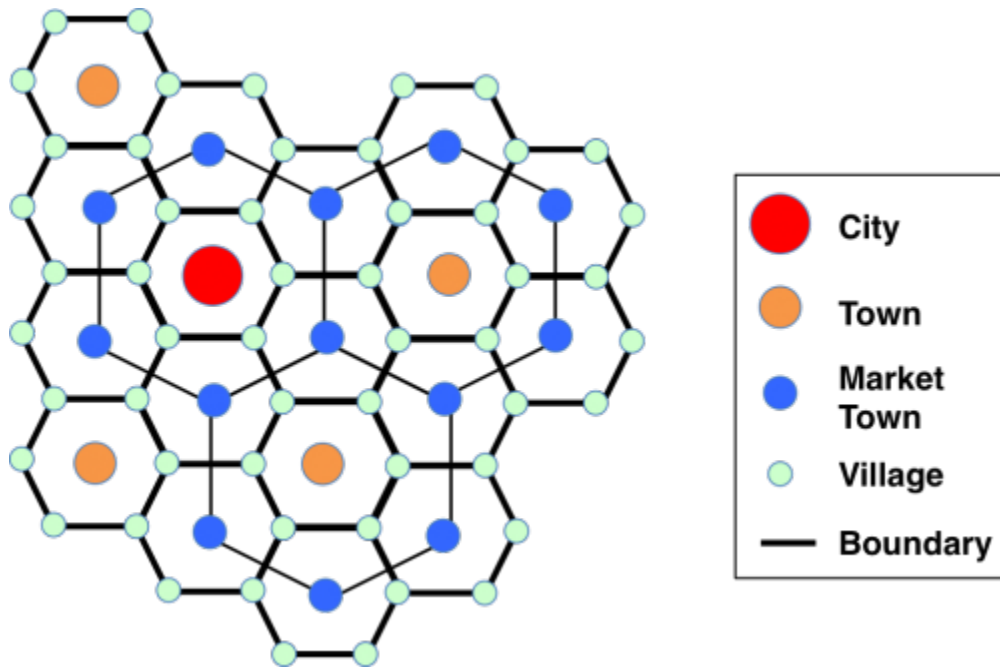
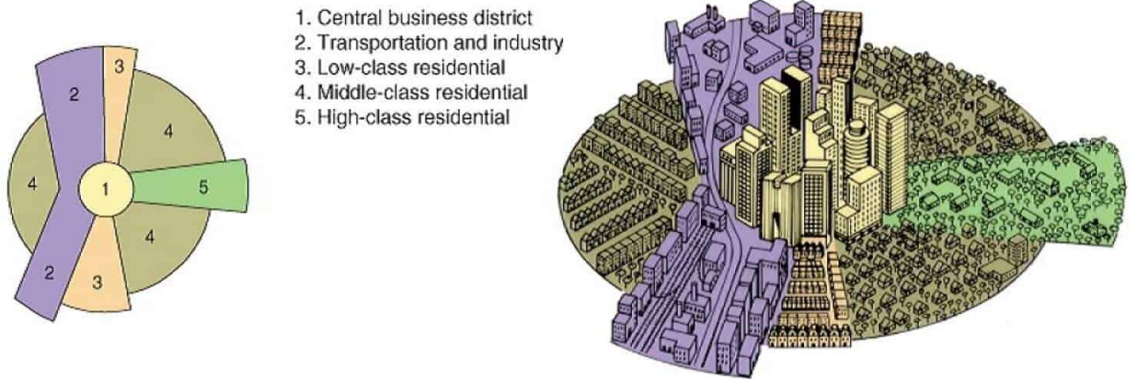


Figure 4: Urban Models

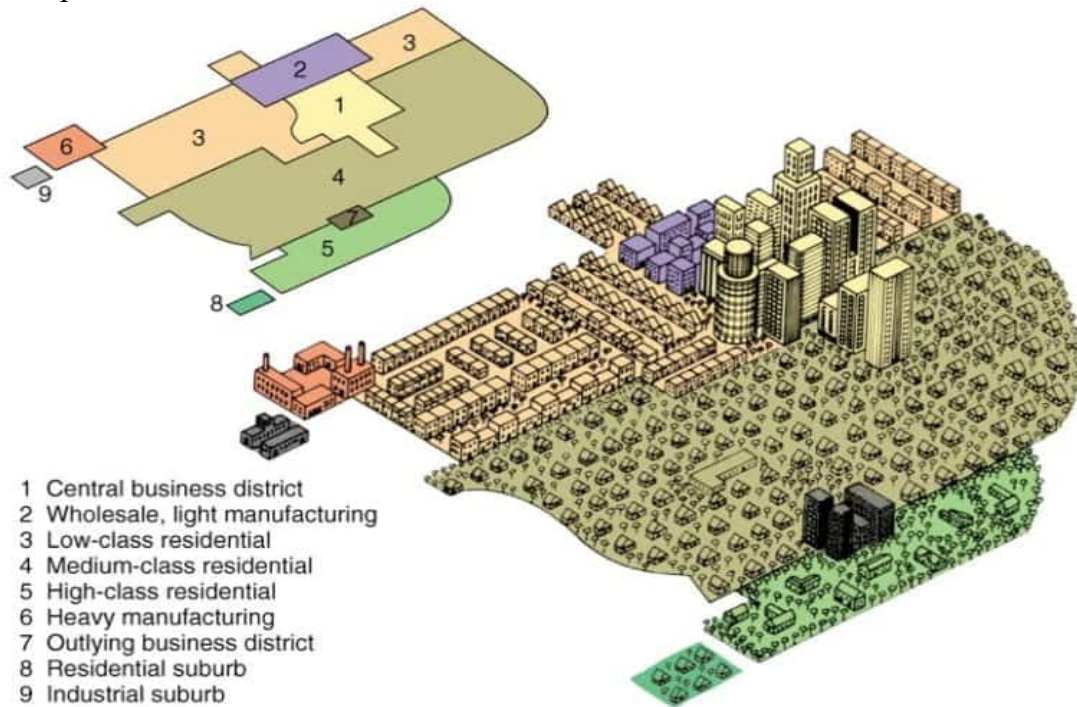
A. Hoyt's Sector Model:



- 1. Central business district
- 2. Transportation and industry
- 3. Low-class residential
- 4. Middle-class residential
- 5. High-class residential

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B. Multiple Nuclei Model:



- 1 Central business district
- 2 Wholesale, light manufacturing
- 3 Low-class residential
- 4 Medium-class residential
- 5 High-class residential
- 6 Heavy manufacturing
- 7 Outlying business district
- 8 Residential suburb
- 9 Industrial suburb

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C. Concentric Zone Model:

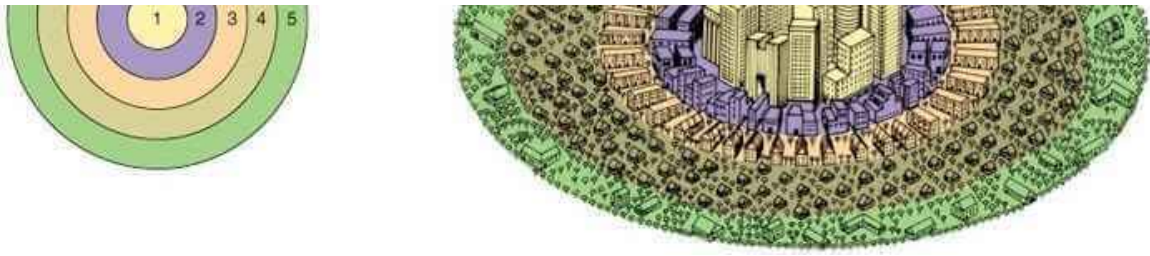


Figure 5: Von Thunen Model





## Bibliography

<http://schools.cms.k12.nc.us/independenceHS/Pages/AboutOurSchool.aspx>

<https://apcentral.collegeboard.org/about-ap/ap-a-glance> The College Board website is the go-to page for all AP teachers. College Board offers insightful information for AP teachers to help them not only plan their course, but also offers lesson plan ideas.

<https://apcentral.collegeboard.org/courses/ap-human-geography/course>. This website breaks down Human Geography into the seven units and gives not only an overview of each unit but gives insight into key concepts that need to be covered.

Keeping A Natural Journal. Clare Walker Leslie and Charles E. Roth

<https://www.kaptest.com/study/ap-human-geography/ap-human-geography-cities-and-urban-land-use-notes> Kaptest is a great website to obtain lessons and notes to help your students succeed in class and on the national test.

<https://neomsaudicity.net/top-largest-megacities-2017/>

<https://www.epa.gov/ejscreen>

Remaking The North American Food System: Strategies for Sustainability. Edited by Clare Hinrichs and Thomas A. Lyson

Urban Forum ISSN: 1015-3802 (print) 1874-6330 (online) Jane Battersby, Jonathan Crush

Land and the City. Patterns and Processes of Urban Change. Philip Kivell

Palaces for the People. Eric Klinenberg My students read this book as part of a class project. While this book is written from the viewpoint of a sociologist, it does a great deal to help the reader understand infrastructure and how it can help or hinder a city.

Improve Learning with Hands-On Classroom Games, Activities. Janelle Cox. TeachHub.com

[www.elsevier.com/locate/es](http://www.elsevier.com/locate/es). The use of climate knowledge in urban planning. Ingegård Eliasson. Landscape and Urban Planning 48 (2000) 31-44. Received July 19 1999.

Journal of the Air & Waste Management Association. Megacities and Atmospheric Pollution. Molina, Mario J. and Molina, Luisa T. Volume 54, 2004, issue 6.

<https://besdirector.blogspot.com/2011/10/what-is-metacity.html>.

[https://www.researchgate.net/profile/Nelson\\_Urssi/publication/325524221\\_Metacity\\_Design\\_Data\\_e\\_Urbanity/links/5be30d39a6fdcc3a8dc53143/Metacity-Design-Data-e-Urbanity.pdf](https://www.researchgate.net/profile/Nelson_Urssi/publication/325524221_Metacity_Design_Data_e_Urbanity/links/5be30d39a6fdcc3a8dc53143/Metacity-Design-Data-e-Urbanity.pdf)

[https://s3.amazonaws.com/academia.edu.documents/46405498/j.1467-8306.1958.tb01559.x20160611-10883-1n5e7v4.pdf?response-content-disposition=inline%3B%20filename%3DA%20Alternate\\_Explinations\\_of\\_Urban\\_Rank-Siz.pdf&X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=AKIAIWOWYYGZ2Y53UL3A%2F20191023%2Fus-east-1%2Fs3%2Faws4\\_request&X-Amz-Date=20191023T002136Z&X-Amz-Expires=3600&X-Amz-SignedHeaders=host&X-Amz-Signature=f439a28d341d98c890c315a03f373dc7b123998b3c20400227d97d6928da9677](https://s3.amazonaws.com/academia.edu.documents/46405498/j.1467-8306.1958.tb01559.x20160611-10883-1n5e7v4.pdf?response-content-disposition=inline%3B%20filename%3DA%20Alternate_Explinations_of_Urban_Rank-Siz.pdf&X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=AKIAIWOWYYGZ2Y53UL3A%2F20191023%2Fus-east-1%2Fs3%2Faws4_request&X-Amz-Date=20191023T002136Z&X-Amz-Expires=3600&X-Amz-SignedHeaders=host&X-Amz-Signature=f439a28d341d98c890c315a03f373dc7b123998b3c20400227d97d6928da9677)

<http://besurbanlexicon.blogspot.com/2012/06/metacity.html>

Berry, Brian J.L., Garrison, William L. Alternate Explanations of Urban Rank-size Relationships. University of Washington. 1958. Pgs. 83-91.

<http://www.sjsu.edu/faculty/watkins/christaller.htm>

[https://en.wikipedia.org/wiki/Walter\\_Christaller](https://en.wikipedia.org/wiki/Walter_Christaller)

<https://medium.com/@kendallgrace15/periphery-role-in-the-world-systems-theory-fa5d291cac55>

<https://www.quora.com/What-is-the-relevance-of-the-central-place-theory>

<https://www.languagesoftheworld.info/geography/primate-cities.html>

<https://www.wlww.k12.or.us/cms/lib/OR01001812/Centricity/Domain/1839/Crash%20Course%20Review%20-%20Centripetal%20vs%20Centrifugal.pdf>

## Citations

- 
- <sup>i</sup> <http://schools.cms.k12.nc.us/independenceHS/Pages/AboutOurSchool.aspx>
- <sup>ii</sup> <http://schools.cms.k12.nc.us/independenceHS/pages/AboutOurSchool.aspx>
- <sup>iii</sup> <https://apcentral.collegeboard.org/about-ap/ap-a-glance>
- <sup>iv</sup> <https://apcentral.collegeboard.org/courses/ap-human-geography/course>
- <sup>v</sup> <https://apcentral.collegeboard.org/courses/ap-human-geography/course>
- <sup>vi</sup> <https://apcentral.collegeboard.org/courses/ap-human-geography/course>
- <sup>vii</sup> Keeping A Natural Journal. Clare Walker Leslie and Charles E. Roth. p. vii.
- <sup>viii</sup> <https://www.kaptest.com/study/ap-human-geography/ap-human-geography-cities-and-urban-land-use-notes>
- <sup>ix</sup> [www.dictionaries.com](http://www.dictionaries.com) "climate" definition.
- <sup>x</sup> <https://doi.org/10.1002/geo2.5> page 7
- <sup>xi</sup> Climate and its changes: a cultural appraisal. P.4.
- <sup>xii</sup> How to make a city climate-proof, addressing the urban heat-island effect. P. 30
- <sup>xiii</sup> We Are the Weather Makers. P. 195.
- <sup>xiv</sup> Palaces for the People. P. 2
- <sup>xv</sup> The Use of climate knowledge in urban planning. Eliasson, Ingegård. Pp. 33-34.
- <sup>xvi</sup> Frontiers of Science Weather and Climate. Kirkland, Kyle. PhD. P. 5.
- <sup>xvii</sup> Weather and Climate. Decade by decade. Harper, Kristine. Ph.D. P. 180.
- <sup>xviii</sup> <https://apcentral.collegeboard.org/ap-human-geography/classroom-resources/understanding-land-use-patterns?course=ap-human-geography>
- <sup>xix</sup> Palaces for the People. P. 8
- <sup>xx</sup> <https://www.teachhub.com/improve-learning-hands-classroom-games-activities>
- <sup>xxi</sup> <https://neomsaudicity.net/top-largest-megacities-2017/>
- <sup>xxii</sup> Megacities and Atmospheric Pollution. (Abstract)
- <sup>xxiii</sup> <https://besdirector.blogspot.com/2011/10/what-is-metacity.html>
- <sup>xxiv</sup> <http://besurbanlexicon.blogspot.com/2012/06/metacity.html>
- <sup>xxv</sup> <https://besdirector.blogspot.com/2011/10/what-is-metacity.html>
- <sup>xxvi</sup> [https://en.wikipedia.org/wiki/Walter\\_Christaller](https://en.wikipedia.org/wiki/Walter_Christaller)
- <sup>xxvii</sup> Alternate explanations of urban rank-size relationships. P. 83.
- <sup>xxviii</sup> <https://www.languagesoftheworld.info/geography/primate-cities.html>
- <sup>xxix</sup> <https://apcentral.collegeboard.org/courses/ap-human-geography/course?course=ap-human-geography>
- <sup>xxx</sup> <https://www.wlww.k12.or.us/cms/lib/OR01001812/Centricity/Domain/1839/Crash%20Course%20Review%20-%20Centripetal%20vs%20Centrifugal.pdf>. P. 2
- <sup>xxxi</sup> <https://medium.com/@kendallgrace15/periphery-role-in-the-world-systems-theory-fa5d291cac55>
- <sup>xxxii</sup> <https://www.quora.com/What-is-the-relevance-of-the-central-place-theory>
- <sup>xxxiii</sup> <https://planningtank.com/settlement-geography/hoyt-model-sector-model-land-use-1939-homer-hoyt>
- <sup>xxxiv</sup> <https://planningtank.com/settlement-geography/multiple-nuclei-model-1945-harris-ullman-model>
- <sup>xxxv</sup> <https://planningtank.com/settlement-geography/burgess-model-or-concentric-zone-model>
- <sup>xxxvi</sup> <https://thegreenhorns.wordpress.com/2014/08/08/the-von-thunen-model-a-very-cool-lesson-in-agricultural-geography/>