

A Global Perspective on Cities of the Future: Focus on China

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INTRODUCTION:

Population growth is central to many of the environmental, social, and political issues we face today. One of the primary objectives of the Social Studies teacher is to educate students on the impact of human numbers and lifestyles on the surrounding world to ensure that we leave a sustainable future for generations to come. As students examine population changes and their effects on resources, population education is relevant and cross-curricular. China's rapidly growing and urbanizing population provides a relevant and dynamic case to study in the classroom. As China and the United States have embarked on a joint commitment to cut greenhouse gas emissions, the urgency and immediacy of the implementation of more sustainable measures is apparent. While much of the focus on carbon emissions is centered on big businesses and energy consumption, much of the human use of resources in the future will occur in densely populated regions and cities. The planning and construction of cities will determine the future of how individuals use natural resources and impact environmental quality within an urban context. This series of lessons presents the broad challenges associated with global urbanization, examines the existing challenges in China as it shifts to a majority urban population, and analyzes possible steps and plans to achieving a more sustainable urban environment as new cities are established in China and around the world. The lesson is broken into three sections beginning with an examination of population growth as it relates to urbanization, challenges associated with crowded cities, and an examination of new technologies being rolled out around the world aimed at producing a more sustainable city model. Each portion of the lesson draws in specific examples, current events, or trends from China's recent and rapid development. Links and videos are embedded within the powerpoint and throughout the lesson plan that can serve as supplements and extensions based on classroom need, student interest, and background knowledge. The format of the lesson lends itself to be taught in a variety of formats including whole class, individual student research, or in some cases, a flipped-classroom model (where some of the online instruction can occur at home. The culminating activity provides an opportunity for the synthesis of discussions, research, and personal creativity as students make suggestions of how to design cities of the future to better meet the impending challenges and environmental status within a rapidly urbanizing world.

Before beginning the lesson, students should have an understanding about the basics of population growth, vocabulary associated with urbanization, and basic practices in sustainability. Several resources within the "Handouts" section provide resources for introducing this topic more generally.

DESIRED OUTCOMES:

Objectives/Understandings:

Students will be able to identify, record, and explain expected population changes in the world as well as in Southeast Asia in the next 35 years.

Students will be able to recognize population changes, where those changes occur, and what the implications of population changes are for the future of different places around the globe.
Students will be able to analyze current challenges related to population growth and overpopulation related to resources and the environment.

Students will be able to analyze potential innovations and plans for cities of the future.

Students will be able to cite evidence from reading materials and research about the need for a different model for future cities.

Big Ideas:

Population growth and urbanization are a reality that will be a global issue in the next 30 years. China has experienced an unprecedented rate of growth and development over the past 20 years, which is likely to continue for the foreseeable future, albeit at a slower rate. [The annual growth of GDP was over 10% for decades, but has now fallen to under 7%, if one believes the statistics. While European countries and the United States would give a lot to have a growth rate of 7%, the decrease presents significant challenges to China's leaders.]

China's rapid development has come at a high cost to the environment and health for many city residents.

China's model for urban development will be a point of interest for other countries looking for sustainable options in the future.

Misconceptions/Misunderstandings:

Population growth in other countries/places around the world does not affect us.

We do not have a role in changing behaviors of others or thinking about a sustainable future.

Content Standards:

This lesson will enable students to recognize the implications of our global society as it relates to the dynamics of people, places and resources, a core understanding within the Common Core State Standards. Included in readings and discussions, students will explore and consider the wider consequences of the decisions made in cities around the globe for the planet as a whole.

CCSS.ELA-LITERACY.RH.6-8.1

Cite specific textual evidence to support analysis of primary and secondary sources.

CCSS.ELA-LITERACY.RH.6-8.2

Determine the central ideas or information of a primary or secondary source; provide an accurate summary of the source distinct from prior knowledge or opinions.

CCSS.ELA-LITERACY.RH.6-8.7

Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.

Essential Questions:

What concerns should the world have as the human population reaches beyond 7 billion up to 9 billion by 2050?

What natural resources are being depleted or are in short supply in rapidly urban areas of China?

What role do city planners have in creating a more sustainable future?

How will new, sustainable technologies be incorporated into the cities of the future? How will governments/city planners prioritize the use of sustainable products, methods, and plans in their development projects?

How does the expansion of a city versus the creation of a new city differ? What are the advantages and disadvantages of each model?

What role does international dialogue play in designing the cities of the future? Why is it important for an international effort to be made in regards to creating a new model for cities?

ASSESSMENT EVIDENCE

Students will complete guided notes that correspond to the Google Slides presentation. The notes include graphic organizers that will show evidence of students' abilities to make connections, identify cause and effect, and reflect on their reading and research. The final project will evaluate students' ability to synthesize information and create original work based on their understanding of urbanization challenges and possible solutions.

LEARNING PLAN

These lessons are prepared for 90 minute block periods. If teaching within a shorter duration, each lesson can be broken into two parts with discretion.

All three lessons are guided by the Google Slides presentation and can be presented as a whole class activity and discussion where reading materials, slideshows, and videos are examined together. Alternatively, portions or the entire lesson can be shared with students if 1-to-1 technology devices are available. The presentation can be shared using a web address or on Google Classroom.

Lesson 1: The Challenges of Urbanization

A Note-taking packet follows the Google Slides presentation and can be completed in conjunction with the discussions and readings examined in the presentation.

1. Jumpstart / Engagement Intro: Divide students into small groups and ask them to "Discuss the Hypothetical" related to population growth in their community. On white boards or chart paper students can list the beneficial and detrimental effects associated with rapid growth. Have students share responses and create a master "Mind Map" or webbed chart for the class to see.
 1. Technology Option: Use an online Mind-Mapping tool in which students can create a shared mind map combining multiple group ideas to be projected later for the class to review. Popplet is one such application that can be utilized on tablets or individual computers.
2. As a class, select the most pressing issues and determine a possible solution or plan that would address population growth. Discuss some of the ways in which these preparations will affect the community - financially, culturally, socially, etc. Record responses on the "T-Chart" provided in google slides.
3. "Discuss the Reality": Print and post the world population charts around the room or allow students to view them on their own. Report that many places around the world are not dealing with hypothetical population explosions but real and rapid growth statistics.
 1. Ask students which populations they would predict would have the most explosive population growths. Students should cite examples of densely populated regions of Southeast Asia and in developing countries in other parts of the world.

2. Present the headlines from around the world that have dealt with the effects of population growth in unsuccessful ways. Most of the examples are from China and have occurred within the past 2 years. Links are provided for each news article in the “Notes” section of the slides for students to examine in greater depth.
3. Discuss priorities of cities: Students can brainstorm as a group the factors that affect “Standards of Living” and rank what they would prioritize if they were planning cities.
4. Present statistics related to resources around the world and how priorities may be forced upon certain areas depending on resources available.
5. Extension/Homework/Conclusion Activity: Watch Ted Talk: Global Urbanization - The Shareable Future of Cities. Have students respond to the video by describing how cities are an opportunity for improving the future of our environment and planet.
 1. An additional video can be shown as an extension or enrichment activity: Ted Ed: Evolution of Urbanization

Lesson 2: Focus on China

1. Jumpstart / Engagement Activity: Print and cut out enough fact strips for every student in the room. Have students read their own fact, react to it in their notes and meet with two additional classmates. Students will read their facts to each other, react to each other, and find new classmates. Allow all students to “meet and greet” each other until all facts have been reported. When students return to their seats, discuss their reactions and how the facts showcase trends and policies of urbanization in China.
2. Notes on Urbanization: Students record notes on urbanization in China and around the world including statistics, reasons for urbanization, and associated affects with growth. Students can take notes directly from the presentation or you can present each question as an opportunity to predict or discuss.
 1. Additional considerations: US is already a very urban society. Our cities are older and have often expanded due to urban sprawl - a phenomenon that occurs less in China because of scarcity of agricultural land, at least in terms of our traditional definition of suburbia.
 2. Students will view slideshow included in the link embedded in the slideshow. These images include individuals living within Chinese developing cities as well as the images of actual buildings under construction.
2. Read Henry Paulson’s [pls correct the spelling of his name throughout!] article from *NY Times* Opinion page articles. The link is provided to the full article. Students will complete a graphic organizer to summarize how Henry Paulson supports the argument that: China’s future development of cities will address many of its environmental issues today. Note: This article is above the reading level of Grade 6. To modify the reading task, read as a whole class or partner students in heterogeneous groups/pairings that combine stronger and weaker readers. After reading, as a class, discuss why this is an issue that Americans as global citizens should care about.
3. Students will be divided into groups - either teacher or self-selected - and research three current environmental issues that plague cities of modern day China: 1) Water Quality; 2) Air Pollution; and 3) Wetland Destruction

1. Students will complete research notes using the linked articles embedded in Google Slides. Student notes will include an analysis of the problem and cite any solutions described in their reading.
2. Students will report at the end of class on their researched problem stating how each issue is related to urbanization and how this can become (in certain places) or is already a global concern in China.
3. Extension Articles: Two additional topics can be addressed during in-class discussions. Students can read about recent joint efforts of US and Chinese governments to reduce carbon emissions. Students can also read about the effects of deforestation on the environment.

Lesson 3: Cities of the future

1. Jumpstart / Engagement Activity: Students will peruse slideshows and articles related to the 2010 Shanghai World Expo where architects and artists created depictions of future cities of the world that provide or respond to environmental crises of our time. After viewing and responding to these images, students will share out how different architects and artists solved problems in their futuristic interpretations.
2. Students will brainstorm a definition for sustainable city and list the characteristics of such a place.
3. As a class, watch the video, "Sky City, China" and evaluate how this city responds to environmental concerns and sustainability issues.
4. Pairs of students will be assigned (or self-select based on interest) one of the sustainable solution cities within the Google Slides presentation and analyze its ability to solve sustainability issues. Each pair will write a "review" of the city's functionality. In addition to this, students will look at "green practices and technologies" that are already taking effect in cities around the world.
5. Final Project: Students will work in design teams of 3-4 members responding to a hypothetical Request for Proposals. Students will design a sustainable city complete with renderings/illustrations with labels, narrative, and oral presentation. Students will use research of existing environmental concerns from their reading of China's urban challenges as well as the technologies reviewed in this lesson to create this sustainable vision.
6. Conclusion: Students will present their projects to the class.
7. Extension Activities: Two additional explorations are provided: Masdar City near Abu Dhabi and Zira Island near Azerbaijan are two models of carbon zero cities. Students are provided with articles and videos about both.

Student Handouts:
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Lesson 1: People, People Everywhere

Jumpstart: Imagine that your community's population is expected to grow in the next five years. In fact, by 2020, your community's population is expected to triple.

BRAINSTORM: What are some immediate effects of population growth? Web the benefits and drawbacks associated with population growth:

Benefits

Drawbacks

Class Discussion: How could your community plan and prepare for the influx of people?

Effect of Population Growth	Possible Response or Preparation

Class Notes: Discuss the Reality

Define urbanization: _____

Define Standard of Living: _____

Write three facts that you learned from the population charts related to urbanization and population growth around the world:

1. _____

2. _____

3. _____

Class Notes: What factors are included in evaluating a person's "Standard of Living"?

Reaction/Response: Ted Talk - Global Urbanization, The Shareable Future of Cities

Summarize Alex Steffen's description of our challenges as a human species related to population growth. Which of his ideas do you agree with and/or find most powerful? Why?

Lesson 2: Case Study - China's Urbanization Challenges

Jumpstart: Read and React

1. Read your fact about China's rapid development. What does this tell you about China, the future, or about the world we live in?

2. Read your partners' facts about China's rapid development. What do they tell you about China, the future, or about the world we live in?

3. Read your partners' facts about China's rapid development. What do they tell you about China, the future, or about the world we live in?



Class Notes: A Rapid Push for Urbanization

Why is China pushing for Urbanization? Paraphrase three reasons for urbanization as discussed in class:

1. _____

2. _____

3. _____

Class Notes: Read and annotate.

Read Henry Paulson's Opinion Piece in the NY Times. Record your notes below:

P R O B L E M S

What environmental issues does Paulson describe as China continues to move more and more people to cities?	

S O L U T I O N S

What suggestions does Paulson describe to help limit the environmental damage as cities continue to grow?			

Case Study: Chinese Cities and Solutions

Choose a current environmental/sustainability issue facing cities in China. Read multiple articles about your selected topic and record the effects of this issue on people and the environment. Include notes on possible solutions or preparations for dealing with these issues in current Chinese cities.

P R O B L E M : _____

What are some of the effects of this environmental issue?	

S O L U T I O N S

What suggestions are in place to deal with these environmental issues?			

Lesson 3: Cities of the Future

Jumpstart: Slideshow / Imagine a World

Describe two of the artistic portrayals of an imagined future city. What types of innovations did you notice in these new cities?

1. _____

2. _____

Class Discussion: What makes a city sustainable?

City Model: Choose a city of the future to examine. Describe its features and how it addresses sustainability issues.

What are the main features of the city? _____

What innovative approaches does the city use? _____

What sustainability issues did this city attempt to solve? _____

Mini-Research: Sustainable Solutions - Read descriptions of new green technologies being used in cities and communities around the world.

Sustainable Technology description	What does this sustainability issue does this piece of technology solve?	Is this technology already being implemented? If so, where?

FINAL PROJECT: A City for the Future

REQUEST FOR PROPOSAL: Your team (3–4 students) has been approached by government officials to design a city of the future. You are going to design a new city that solves some of the sustainability issues that we’ve studied. You can use existing technology or create your own technology that will improve our planet. This city can serve as a model for many different places on the planet with technologies that are adaptable in different settings.

Requirements:

- Illustration that serves as a blueprint or rendering that could be presented to government officials to showcase and “sell” your city design. Illustration should feature 3–4 new technologies or features that specifically address sustainability issues. Two of the technologies should be existing green tech innovations that are in production or previously-researched devices/structures.
- Project Narrative that describes the city and its features using evidence from previous research to demonstrate how each selected innovation addresses a real-world problem with urbanization.
- Presentation: Present your proposal to the class as though you were actually “selling” your idea to government officials. Your presentation should include some persuasive techniques including evidence from research and reading in class.

Rubric:

	Exceeds Expectations	Meets Expectations	Approaching Expectations	Missing Requirements
Illustration and Presentation of Ideas	Illustration clearly shows through images and labels how and where green technologies are used to enhance the city’s operations. Careful consideration went into the layout of features within the city.	Illustration shows through images and labels how and where green technologies are used to enhance the city’s operations. Layout was taken into account for a few features.	Illustration mostly shows through images and labels how and where green technologies are used to enhance the city’s operations. Intent was unclear through illustrations because of lack of detail or clarity in drawings.	Drawings are unclear and pay little attention to innovations, layout or details.
Written Narrative	Narrative clearly explains purpose and function of 4 innovative features. Description states and explains the problem and effectively addresses how their plan accounts for such concerns.	Narrative explains purpose and function of 3 innovative features. Description states and partially addresses how their plan accounts for such concerns.	Narrative explains purpose and function of 1–2 innovative features. Description does not explain the inherent problem within the city and how their innovations solve these issues.	Narrative does not explain how innovation plays a part in improving the function of this city.
Presentation	Presentation is persuasive, captivating and provides the necessary descriptions to explain how this vision is for cities of the future.	Presentation provides some of the necessary descriptions to explain how this vision is for cities of the future.	Presentation provides descriptions of the city but little evidence that it is a city of the future.	Presentation is unclear and provides little evidence that it is a city of the future.
Evidence and Accuracy of Research	Project includes comprehensive evidence to indicate thorough research. The project portrays examples of present-day issues with urbanization around the world and uses at least 2 examples of real-life new green technologies.	Project includes partial evidence to indicate thorough research. The project portrays examples of present-day issues with urbanization around the world and uses at least 1 example of real-life new green technologies.	Project is missing clear evidence of thorough research. Project describes present-day issues without detail and does not utilize current green technologies.	There is little evidence that the project incorporated research gathered throughout these lessons.
Teamwork	All members of the group participated and cooperated through entire project.	All members of the group participated and cooperated through most of the project.	There were some disagreements unrelated to project while working on the tasks. Certain group members did not contribute to project.	It is clear that there was little effort to work together on the part of certain individuals within the group.

News ELA Articles

[Chinese groups design an app to help environmentalists take on polluters](#)

[PDF](#)

[U.S. and China agree to sharp cuts in greenhouse gas emissions](#)

[PDF](#)

[Chinese are finding their voices in environmental protests](#)

[PDF](#)

[Air pollution takes years off lives in northern China](#)

[PDF](#)

The United Nations news release on its new cities report:

Today, 54 per cent of the world's population lives in urban areas, a proportion that is expected to increase to 66 per cent by 2050. Projections show that urbanization combined with the overall growth of the world's population could add another 2.5 billion people to urban populations by 2050, with close to 90 percent of the increase concentrated in Asia and Africa, according to a new United Nations report launched today.

The 2014 revision of the World Urbanization Prospects produced by the UN Population Division of the Department of Economic and Social Affairs notes that the largest urban growth will take place in India, China and Nigeria. These three countries will account for 37 per cent of the projected growth of the world's urban population between 2014 and 2050. By 2050, India is projected to add 404 million urban dwellers, China 292 million and Nigeria 212 million.

The urban population of the world has grown rapidly from 746 million in 1950 to 3.9 billion in 2014. Asia, despite its lower level of urbanization, is home to 53 per cent of the world's urban population, followed by Europe with 14 per cent and Latin America and the Caribbean with 13 per cent.

The world's urban population is expected to surpass six billion by 2045. Much of the expected urban growth will take place in countries of the developing regions, particularly Africa. As a result, these countries will face numerous challenges in meeting the needs of their growing urban populations, including for housing, infrastructure, transportation, energy and employment, as well as for basic services such as education and health care.

"Managing urban areas has become one of the most important development challenges of the 21st century. Our success or failure in building sustainable cities will be a major factor in the success of the post-2015 UN development agenda," said John Wilmoth, Director of the Population Division in the UN's Department of Economic and Social Affairs.

Mega-cities with more than 10 million people are increasing in number

The report notes that in 1990, there were ten "mega-cities" with 10 million inhabitants or more, which were home to 153 million people or slightly less than seven per cent of the global urban population at that time. In 2014, there are 28 mega-cities worldwide, home to 453 million people or about 12 percent of the world's urban dwellers. Of today's 28 mega-cities, sixteen are located in Asia, four in Latin America, three each in Africa and Europe, and two in Northern America. By 2030, the world is projected to have 41 mega-cities with 10 million inhabitants or more.

Tokyo remains the world's largest city with 38 million inhabitants, followed by Delhi with 25 million, Shanghai with 23 million, and Mexico City, Mumbai and São Paulo, each with around 21 million inhabitants.

Osaka has just over 20 million, followed by Beijing with slightly less than 20 million. The New York–Newark area and Cairo complete the top ten most populous urban areas with around 18.5 million inhabitants each.

Although Tokyo's population is projected to decline, it will remain the world's largest city in 2030 with 37 million inhabitants, followed closely by Delhi, whose population is projected to rise swiftly to 36 million in 2030. While Osaka and New York–Newark were the world's second and third largest urban areas in 1990, by 2030 they are projected to fall in rank to the 13th and 14th positions, respectively, as mega-cities in developing countries become more prominent.

Small cities are numerous and many are growing rapidly

Overall, nearly half of the world's 3.9 billion urban dwellers reside in relatively small settlements with fewer than 500,000 inhabitants, while only around one in eight live in the 28 mega-cities with 10 million inhabitants or more. Many of the fastest growing cities in the world are relatively small urban settlements.

Rural populations expected to decrease as urban populations continue to grow

The rural population of the world has grown slowly since 1950 and is expected to reach its peak around 2020. The global rural population is now close to 3.4 billion and is expected to decline to 3.1 billion by 2050. While Africa and Asia are urbanizing rapidly, the regions are still home to nearly 90 per cent of the world's rural population. India has the largest rural population with 857 million, followed by China with 635 million.

Sustainable urbanization is key to successful development

The report notes that a successful urban planning agenda will require that attention be given to urban settlements of all sizes. If well managed, cities offer important opportunities for economic development and for expanding access to basic services, including health care and education, for large numbers of people. Providing public transportation, as well as housing, electricity, water and sanitation for a densely settled urban population is typically cheaper and less environmentally damaging than providing a similar level of services to a dispersed rural population.

The 2014 revision of the World Urbanization Prospects provides new and updated information on global urbanization trends and city growth. Such information is vital for setting policy priorities to promote inclusive, equitable and sustainable development for urban and rural areas alike. Recognizing the importance of smaller cities and towns, this latest revision expands the number of cities and provides, for the first time, population estimates and projections for all of the world's urban settlements with 300,000 inhabitants or more in 2014.

Extension Activities, Resources, and Lesson Supplements:

7 billion: Are you typical?

If the world lived like the typical American..

<https://www.youtube.com/watch?v=4B2x0vKFFz4>

National Geographic: 7 billion

<https://www.youtube.com/watch?v=sc4HxPxNrZ0>

7 billion and counting

<https://www.youtube.com/watch?v=d1dIAtvSFLM>

Push and Pull Factors (not China specific)

<http://www.emigration.link/push-pull-factors-urbanization.htm>

Megacities

<http://www.bloomberg.com/news/articles/2015-04-20/there-are-even-more-megacities-in-china-than-you-thought>