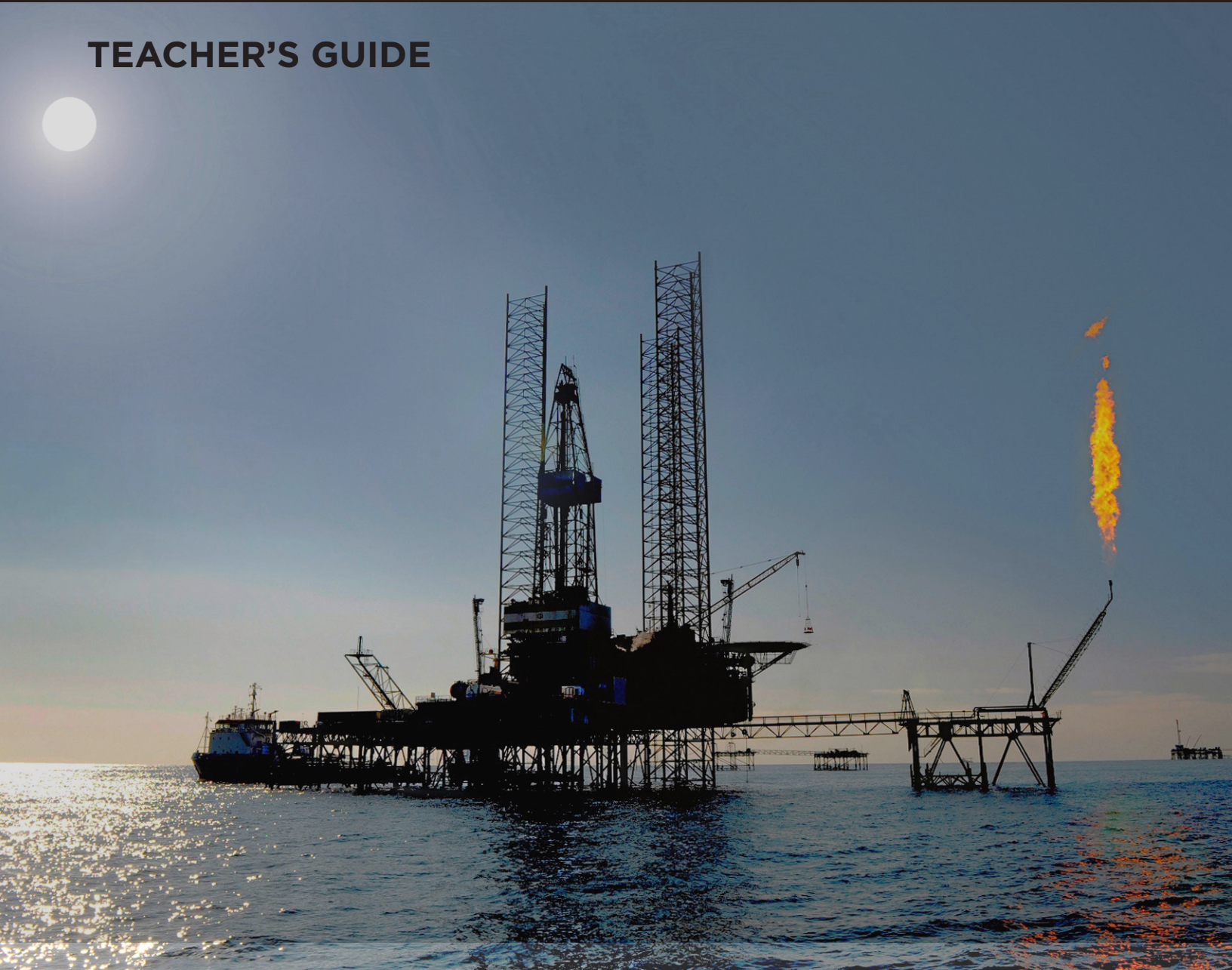


The Henry M. Jackson School of International Studies and Newspapers In Education present

GLOBAL ENERGY TODAY: THE ASIAN NEXUS

by Tese Wintz Neighbor

TEACHER'S GUIDE



THE HENRY M. JACKSON
SCHOOL OF INTERNATIONAL STUDIES
UNIVERSITY of WASHINGTON



INSPIRING STUDENTS TO LEARN

To register for NIE, visit us at
seattletimes.com/nie or call
206.652.6290.

GLOBAL ENERGY TODAY: THE ASIAN NEXUS



ABOUT THE “GLOBAL ENERGY TODAY: THE ASIAN NEXUS” SERIES

“Global Energy Today: The Asian Nexus” is a collaborative project between the Newspapers In Education program of *The Seattle Times* and the University of Washington’s Henry M. Jackson School of International Studies Asia and Global Studies outreach centers. The project consists of a six-article series designed with high school readers in mind, a teaching guide and a workshop for secondary teachers. Students will explore how energy demand has shifted from mostly western nations to the developing world, specifically Asia. They will trace this region’s transition (however slow) toward low- and non-carbon energy sources.

The six-part Asia series begins with an overview of global energy today and its growing connections to Asia. The following six articles pinpoint specific regions in Asia as many countries begin to focus on industrial modernization in terms of transport, lifestyles, and electrification. This teaching guide provides activities to do with students before, during and after reading each featured weekly article. Together, the articles and accompanying lessons take students on an exploration of Asia’s high-speed modernization and consequent growing energy needs. The goal is to challenge them to look at numerous issues from multiple perspectives and to explore the opportunities and challenges facing this region in the 21st century. The points of view represented in the articles and guide materials represent a sampling of perspectives on these issues.

AUTHOR OF THE TEACHING GUIDE

The author of the teaching guide for “Global Energy Today: The Asian Nexus” series is Tese Wintz Neighbor, who received a Master of Arts in China regional studies from the Henry M. Jackson School of International Studies at the University of Washington. She worked as the senior director of professional development for the Seattle World Affairs Council for 13 years. She also teaches intensive Asia seminars for the National Consortium for Teaching about Asia, regionally based at the University of Washington’s East Asia Resource Center. Neighbor is the author of numerous curricula on Asia, including “Journey Down the Yangtze: From Dragon’s Tail to Dragon’s Head” (East Asia Resource Center, 1998), “Teacher’s Guide to Treasures From a Lost Civilization: Ancient Chinese Art From Sichuan” (Seattle Asian Art Museum, 2001), “Understanding the World of Political Cartoons” (Newspapers In Education, 2003), “China Matters” (World Affairs Council, 2008), “Global Health: Asia in the 21st Century” (Newspapers In Education, 2009), “Exploring Asia: Human Rights” (co-author, Newspapers In Education, 2011), “Exploring Asia: Islam in Asia” (Newspapers In Education, 2012), “Exploring Asia: Political Change in the 21st Century” (Newspapers In Education, 2013), “Exploring Asia: Asian Cities — Growth and Change” (Newspapers In Education, 2014) and “Global Asia: Yesterday, Today and Tomorrow” (Newspapers In Education, 2015).

ACKNOWLEDGEMENTS

“Global Energy Today: The Asian Nexus” series was created by six outreach centers in the Henry M. Jackson School of International Studies, University of Washington: the East Asia Center; the East Asia Resource Center; the Ellison Center for Russian, East European and Central Asian Studies; the Center for Global Studies; the South Asia Center; and the Southeast Asia Center.

TABLE OF CONTENTS

Lesson One	Global Energy Today: The Asian Nexus
Lesson Two	Central Asia: Energy, Resources, Politics, and Climate Change
Lesson Three	Some Fundamental Problems of Energy Development in South Asia
Lesson Four	Toward Building Energy Efficiency and Conservation in Southeast Asia: Indonesia’s “Low-Hanging Fruit” for Energy Saving
Lesson Five	East Asia: New Center of Global Energy and Related Issues
Lesson Six	Conclusion

GLOBAL ENERGY TODAY: THE ASIAN NEXUS



LESSON ONE

Pair with “Global Energy Today: The Asian Nexus” by Scott L. Montgomery

Introduction

The lessons in this teaching guide, paired with six articles appearing in *The Seattle Times* Newspapers In Education series, introduce students to global energy issues today — with a focus on Asia. In this first lesson, students will begin to grapple with the “new energy era that has arrived in Asia.” This broad overview provides a foundation for students to begin to investigate the opportunities and challenges currently facing Asia — the new center of global energy use.

Objectives

- Students will build their geographic and demographic knowledge of Asia
- Students will identify the author’s main idea and supporting details
- Students will learn about global energy trends — and the sources and demand for energy in Asia

Focus Questions

1. Why is it important to study Asia today?
2. Discuss the author’s opening sentence: “Global energy, we can safely say, has entered a new historical era.” What are Asia’s most pressing energy challenges and opportunities today?
3. How might industrial development and growing energy demand impact individual Asian countries and this region as a whole in the next decade? How might this impact the United States and the rest of the world?

Materials

- *The Seattle Times* article
- Computer/Internet access
- ThingLink free application (<https://www.thinglink.com/edu>)
- Handout A: Population Distribution in Asia

Activities

Before reading

1. Assess students’ prior knowledge of Asia. Asia is in the headline news every day. What have they read recently? Which countries are located in Asia? How many people live there — and where do they live? Divide the class into small groups of two or four and pass out **Handout A: Population Distribution in Asia** to each group. They will need access to the Internet for population and geography research. Ask them to (a) find the Asian countries listed on the map on Handout A and label them; (b) find and then jot down next to each country the population statistics in red ink (population statistics for China are completed); (c) finally, since North and South Korea are missing population dots, ask them to complete those.

Note: If more basic background information on Asia would be helpful, view these websites to build students’ knowledge:

BBC Country Profile. Full profiles provide an instant guide to history, politics and economic background of countries and territories, as well as background on key institutions. They also include audio and video clips from BBC archives: http://news.bbc.co.uk/2/hi/country_profiles/default.stm

Map. An excellent topographic map highlights the obstacles of high population density, soaring mountains and isolated valleys (limited arable land): http://web.mac.com/~etzion_a/map/earth/asia.jpg

GLOBAL ENERGY TODAY: THE ASIAN NEXUS



- Armed with the knowledge (1) that the population of Asia is huge; (2) that daily headlines abound with regard to Asia’s high-speed industrial revolution; and (3) that this series of *The Seattle Times* articles will illustrate the rising demand for resources to fuel this high-speed modernization, ask students to begin a notebook page with three columns. Title the columns DILEMMA, STAKEHOLDERS, and ACTION PLAN (see example below).

Over the next six weeks, ask them to categorize their thoughts as they deal with the dilemmas over the need for increased energy consumption and the need to deal with environmental degradation, etc.

Example:

DILEMMA	STAKEHOLDERS	ACTION PLAN
700 million without electricity while Asia now produces more carbon emissions than the rest of the world combined.	Asians without electricity for living and working; Asians living in polluted areas (air, water, soil, etc.); others in the world affected by climate change due to greenhouse gas effect.	Invest in energy transition to noncarbon sources; develop green urban planning; clean up air, water and soil.

- Assess students’ knowledge of energy. Ask them to write down the primary sources of the world’s energy (oil, natural gas, coal, nuclear, hydropower, biomass, wind, solar, and geothermal). Which country consumes more energy? (China) Besides China, what are the top four energy consumers in the world? (United States, Russia, India, Japan). Inquiring energy minds may want to visit the Global Energy Statistical Yearbook for more data and maps: <https://yearbook.enerdata.net/>

During and after reading

- Explain to students that the author, Scott Montgomery, discusses a “new energy era” that has arrived in Asia and offers both “opportunity and complexity.” As students read the article, ask them to circle what the author considers “opportunities” and underline what he considers “complexities” or challenges. What have they heard recently in the news and/or learned in school that corresponds with his article? What do they want to learn more about? Ask them to jot down three questions that they are curious about.
- Who are some of the “new-era” stakeholders as Asian countries continue to power up during this decade and beyond? Ask students to brainstorm and then have one student list 10-15 of these on the board. (They might include national and local government leaders, oil developers, coal miners, farmers, factory owners, factory workers, alternative fuel developers, environmentalists, etc.)
- Building on the above activity, divide students into small groups. Have each group choose one of the stakeholders and discuss what they believe might be his/her perspectives and interests. Ask them to list specific opportunities and challenges he/she might face during this new era. Depending on time, this could be a short brainstorming exercise or, if time permits, students could find articles on individuals or companies in the news and the reported opportunities and challenges they are dealing with. (Remind them to add to their DILEMMA, STAKEHOLDERS, ACTION PLAN chart.)

GLOBAL ENERGY TODAY: THE ASIAN NEXUS



Assessment

Ask students to pair up and create a thematic (energy) map choosing one of the following Asian countries: China, Taiwan, India, Pakistan, South Korea, North Korea, Japan, Indonesia, Afghanistan, Thailand, Myanmar, the Philippines.

They will need access to the Internet in order to research the following facts/statistics: energy consumption by type, energy production by type, energy exports and imports. (Remind them that energy statistics are constantly changing; request that they find the most up-to-date statistics and that they record sources and publication dates of those sources.) Recommended resources: US Energy Information Administration, World Bank Development Indicators, World Energy Outlook, and the National Energy Development Project.

Challenge them to be creative and incorporate their facts/statistics into the map — or in a box below the map. (For example, tiny oil rigs and/or wind turbines could be drawn into the map, while the statistics of oil output could be included below the map in a box.) In addition to charting petroleum deposits, etc., they may want to include topographical features, future energy development types/sites, earthquake faults, great rivers, transportation hubs or other features that relate to economic, industrial and technological development. Encourage them to be creative using photos, graphs, colored markers, etc. They can design the map on poster board or butcher block paper or on a computer.*

**Teachers and/or students who are familiar with ThingLink may enjoy using this free tagging platform to layer their images with weblinks, photos, texts, statistics and videos <https://www.thinglink.com/edu>*

Example: <https://www.thinglink.com/scene/919308539065794564>

Finally, have them consider these questions: How might _____ (name a country in Asia) population, as well as industrial and energy trends, impact the rest of Asia in the next decade? How might they impact the United States? Depending on time, have them share with the whole class or choose another student pair to share their maps and future forecast with.



LESSON TWO

Pair with “Central Asia: Energy, Resources, Politics and Climate Change” by Scott Radnitz

Introduction

The article paired with this lesson introduces students to the energy resources found in the five former Soviet countries of Central Asia : Tajikistan, Kyrgyzstan, Kazakhstan, Turkmenistan and Uzbekistan. Students will analyze the author’s opening sentence: “Central Asia is blessed with abundant energy resources but cursed with governments that manage them badly.” This lesson challenges students to explore the impact of limited and unlimited natural resources on regional geopolitics.

Objectives

- Students will expand their knowledge of the relationship between natural resources and politics in Central Asia
- Students will reflect on how this relationship impacts the residents of each country
- Students will prepare a news interview about a current challenge or opportunity facing this region today

Focus Questions

- What are the most pressing energy challenges facing each of the “former Soviet countries”?
- How and why are they wrestling over energy resources when together they are blessed with energy resources and abundant water from snowmelt?
- What might be a possible long-term mutual strategy for the “five former Soviet countries” regarding agriculture and industrial development, resource sharing and infrastructure building while working on environmental sustainability?

Materials

- *The Seattle Times* article
- Computer/Internet access
- Handout B: Population and Resources (Central Asia)

Activities

Before reading

1. Assess students’ prior knowledge of Central Asia. Where in the world is Central Asia? (Central Asia stretches from the Caspian Sea in the west to China in the east and from Russia in the north to Afghanistan in the south.) How large is it? (It is huge, covering an area of 4,003,451 km²/1,545,741 mi².) Can they list the countries in Central Asia? (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan) What do they know about each of these countries (headline news, culture, history, religion, and geography)?

Note: “-stan” is a Persian suffix meaning “land of.”

2. Next, project a map of Central Asia on the board in order for students to locate these countries. Ask for five volunteers to each describe the landscape and topography for one of these countries while the rest of the class closes their eyes. http://www3.utsidan.se/corax/Maps/central_asia.jpg



During and after reading

1. Explain to students that *The Seattle Times* article is about geopolitics in Central Asia with a focus on energy resources. Ask students to read the article and underline the author's main ideas and his supporting evidence. Ask them to circle one or two issues that they would like to learn more about. After they have read the article, ask them to write a short three-question quiz based on their reading. On a separate piece of paper, have them record the answers. Finally, ask them to pair up with another classmate and have each one take the other's quiz and then compare answers.
2. Divide the class into small groups of two or three and pass out **Handout B: Population and Resources** to each group. They will need access to the Internet for statistics. Ask them to (a) complete the population statistics for the "five former Soviet countries"; (b) list the main energy resources found in each country (oil, natural gas, water for hydroelectric) and agricultural products; (c) designate on the map those energy reserves, rivers, glaciers, agricultural product locations, etc. Encourage them to note any other statistics of interest (desertification, air and/or water pollution, urbanization, health and education statistics, languages, religions, etc.).

Assessment

The title of this article is "Central Asia: Energy, Resources, Politics and Climate Change." Ask students to pair up and find two or three articles that focus on one of these topics that interest them — these articles should include local voices and quotes from Central Asians. While Radnitz's article gives an excellent overview tying these issues together, ask students to look for articles that spotlight an issue or two that they are particularly interested in (nonrenewable and renewable energy development, current politics, import-export trade products, agricultural production, animal husbandry, nomadic life, urban growth, water disputes, climate change, environmental degradation, desertification, etc.). It could be one that they circled in their initial reading or a statistic they uncovered in the last exercise.

News sources that frequently report on Central Asia include *BBC News*, *The Economist*, *EurasiaNet*, *Radio Free Europe/Radio Liberty (RFE/RL)*, *The New York Times*, *Al Jazeera*, *The Guardian*, *Reuters* and *PBS Newshour*. Encourage them to check government or embassy websites for access to English-language newspapers based in Central Asia.

Task each pair to prepare a two-minute TV report with one being the reporter and the other being the local interviewee. Each report should include who, what, where, when and why. Ask the reporter to conclude the interview by either reflecting on the impact this topic or event has on the rest of Central Asia and/or other parts of the world and then possible action plans for the future.

Finally, have each pair present their report to the class, using a map or real photo projected behind them as a backdrop, bringing the topic alive to the viewers. They can choose to do it live in front of the class or videotape it and project it on the screen.



LESSON THREE

Pair with “Some Fundamental Problems of Energy Development in South Asia” by Michael Walstrom

Introduction

The article paired with this lesson introduces students to the complexities of energy development in South Asia. The reading and this companion lesson challenge students to consider “Who is development for? And at what cost?”

Objectives

- Students will examine some of the fundamental problems of energy development in South Asia
- Students will discuss the reasons why local people might demand new power plants in their area and why others might oppose their construction
- Students will prepare a PowerPoint presentation focusing on one aspect of energy development in South Asia

Focus Questions

- Who is development for? And at what cost?
- Should electricity be considered a human right?
- Air pollution is a serious problem in a number of South Asian cities. How are the governments working to address these problems?

Materials

- *The Seattle Times* article
- Computer/Internet access
- ThingLink free application (<https://www.thinglink.com/edu>)

Activities

Before reading

1. Project this map of India, Nepal and Pakistan on the board:
http://1.bp.blogspot.com/-bLDZAyoj0k4/VUdN_7uD3TI/AAAAAAAAAFvE/eIASRWkGfX8/s1600/south-asia-physical-map.jpg

Ask one student to write the populations of the countries on the board — and record the total population of these three countries (they have already recorded this information on Handout A). Share with your students that more than 300 million people — almost one out of six— in South Asia do not have access to electricity. Ask students to quickly brainstorm the opportunities that access to electricity will afford, and ask one student to list these on the board. Then share with them this sentence from the article: “Despite the region’s great need for electricity, new power plants often face local opposition.” Again, ask them to quickly brainstorm why citizens might protest the construction of a power plant, and ask one student to list these reasons on the board.
2. Before students begin reading Michael Walstrom’s article, “Some Fundamental Problems of Energy Development in South Asia,” challenge them to ponder his concluding questions: “Who is development for? And at what cost?” Again, have them brainstorm who the stakeholders are and what each has to gain or lose. Encourage them to add these to their growing notebook list.



During and after reading

1. The author points out that some South Asians feel that “electricity should be considered a human right.” Ask students who agree with this to stand on one side of the room and those who disagree to stand on the other side. Write on the board two columns headed by “points” and “counterpoints.” Ask each student to briefly explain their point or counterpoint and record on the board. If time permits, they could pair up and engage in mini-debates. Encourage students to acquaint themselves with the 30 articles listed in the Universal Declaration of Human Rights: <http://www.un.org/en/universal-declaration-human-rights/index.html>
2. Walstrom’s article is packed with “bullet-point” facts. As students read the article, ask them to number and underline all of these facts that they encounter. When they are finished, ask them to go back over the points that they underlined and have them choose one to research (in preparation for their final assessment exercise). Ask them to (1) write down the statement that they chose; (2) write three questions on this topic that they would like to find out the answers to; (3) jot down five statistics they hope to find; and (4) brainstorm types of maps, graphs, and/or photos that they will look for.

Assessment

In this assignment, students will be tasked to put together a short PowerPoint presentation or ThingLink (<https://www.thinglink.com/edu>) focusing on the fact or topic that they chose. They can work alone or with a partner. This PPT file or ThingLink should include the answers to their questions listed above, as well as the statistics, graphs, and/or photos that they brainstormed for their research. Depending on time, each person or pair can share with the entire class, or pair with another two students and share with them. To spur their interest, share one or more of these relevant articles:

Unraveling the Myriad Causes of North India’s Pollution Pall:
<http://e360.yale.edu/features/origins-of-north-indias-air-pollution>

Can Uber-Style Buses Help Relieve India’s Air Pollution?
http://e360.yale.edu/features/can_uber_style_buses_help_relieve_india_air_pollution

The Human Cost of Indian’s Push to Produce More Coal:
http://e360.yale.edu/features/on_burning_ground_human_cost_indias_push_produce_more_coal

In Rural India, Solar-Powered Microgrids Show Mixed Success:
http://e360.yale.edu/features/in_rural_india_solar-powered_microgrids_show_mixed_success

Extracurricular

Students who are interested in the impact of climate change on wild animals in South Asia may be interested in watching this 20-minute Tedx Talk: <https://www.youtube.com/watch?v=8ZBS1-z3tal>

Speaker Bittue Sahgal is an environmental activist, the editor of Sanctuary Asia Magazine and the founder of Kids for Tigers, the sanctuary tiger program involving one million children across India.



LESSON FOUR

Pair with “Toward Building Energy Efficiency and Conservation in Southeast Asia: Indonesia’s ‘Low-Hanging Fruit’ for Energy Saving” by Lysandra A.M. Bitticaca

Introduction

The article paired with this lesson introduces students to the importance of energy efficiency in Southeast Asia — one of the fastest-growing construction markets in the world. Lysandra A.M. Bitticaca focuses on Indonesia, Southeast Asia’s largest energy market. This lesson challenges students to use their creativity to design an app or perform a rap that spotlights energy conservation.

Objectives

- Students will explore Southeast Asia by maps and understand the importance of tackling climate change
- Students will focus on Indonesia — the largest energy market in Southeast Asia — and the connection between energy consumption and Indonesia’s fast-growing building sector
- Students will strategize ways to improve energy efficiency in the building sector by designing an app or performing a rap

Focus Questions

- What are some of Southeast Asia’s most pressing energy concerns?
- Indonesia’s building sector accounts for roughly one-fifth of its total energy consumption; in what ways is this country making energy efficiency and conservation national strategic priorities?
- Is educating the people about the energy efficiency in building as crucial as installing high-efficiency technology in the buildings and establishing stringent regulations?

Materials

- *The Seattle Times* article
- Computer/Internet access

Activities

Before reading

1. Begin this exercise by asking the following three questions. Ask students to quickly write “true” or “false” for each question on a piece of paper.
 - Buildings account for more than one-third of energy use in many countries
 - Buildings contribute nearly 10 percent of global carbon emissions
 - Constructing more-energy-efficient buildings is crucial for tackling climate change and for national energy security

Inform your students that all of these answers are true — in fact, they are the first three lines of this week’s article by Lysandra A.M. Bitticaca “Toward Building Energy Efficiency and Conservation in Southeast Asia: Indonesia’s ‘Low-Hanging Fruit’ for Energy Saving”. Next, review the countries in and the location of Southeast Asia by projecting this “Multiple Climate Hazard Map of Southeast Asia” on the board:

http://www.preventionweb.net/files/7864_asiacimatechangevulnera%5b1%5d.jpg

Using a pointer, indicate the areas on the map that are bright red (indicating the climate hazard “hotspots”) and ask students to identify — and speculate — what might be the dominant hazards. These hotspot areas and dominant hazards include northwestern Vietnam (droughts), eastern coastal areas of Vietnam (cyclones and droughts), Mekong region of Vietnam (sea level rise), Bangkok and its surrounding area in Thailand (sea level rise and floods), southern regions of Thailand (droughts and floods), the Philippines (cyclones, landslides, floods, and droughts), Sabah state in Malaysia (droughts), and western and eastern areas of Java Island in Indonesia (droughts, floods, landslides, and sea level rise). If students are interested in viewing other climate change maps and charts, share this comprehensive 32-page pdf document from the Economy and Environment Program for Southeast Asia (EEPSEA):

<https://www.idrc.ca/sites/default/files/sp/Documents%20EN/climate-change-vulnerability-mapping-sa.pdf>



2. Since this week's article focuses on Indonesia, you may want to assess students' prior knowledge of Indonesia. You could run through another quick true-and-false exercise such as the one below (again, all of the answers are true).
 - Indonesia is made up of 17,000 islands
 - It spans 5,150 kilometers (3,200 miles) east to west
 - It is the world's fourth most populous nation and is 86 percent Muslim — making it the world's largest Islamic country
 - Out of 17,000 islands, some 130 million people — or 60 percent of the population — live on Java, an island the size of New York State (population 20 million)
 - Indonesia has the largest economy in Southeast Asia — and it is continuing to undergo rapid development and economic growth

Discuss the meaning of “development.” It is often considered a positive element for people, neighborhoods, cities, countries, etc. Ask students to brainstorm a list of opportunities for people living in countries undergoing rapid development (growing economies, developing industries, increasing standards of living, improving health care, increased food production with agriculture mechanization, transportation improvement, and expanding educational opportunities).

Then have them consider and discuss the following statement: “The greatest threat to the environment in Indonesia is development.” Read out loud the following quote from the head of the World Wide Fund for Nature in Indonesia from an interview with *The New York Times*: “We are in a constant race with development. Before we even have a chance to convince the wider audience here that environmentally sound development is a viable way to do things, the plans to build roads, factories or power plants are already moving ahead. We have a problem here with unemployment, so any developer who can sell promises of employment will get support. When that happened, we get labeled against employment and get treated as outsiders.” (Find this quote and other relevant facts about environmental issues in Indonesia here: http://factsanddetails.com/indonesia/Nature_Science_Animals/sub6_8c/entry-4090.html)

During and after reading

1. Ask students to underline the author's main ideas and her supporting evidence; encourage them to highlight information that is new to them as they read the article. Next, ask students to write three true-or-false questions and answers (including at least one false question), glean information from this article. Then ask them to partner with another classmate to take each other's tests. Choose a few students to share their questions and answers.
2. Divide the class into groups of four or five students. Ask one student to read out loud the last line of the first paragraph of this week's article: “While energy efficiency means using less energy to provide the same service without giving up the building occupants' comfort, energy conservation requires occupants to change behaviors to lower the energy demand.” Challenge each group to ponder energy used in their homes, school, a large community site (stadium, convention center), a nearby hotel, and a local industry (Boeing, Amazon, etc.). Ask each student to choose one of these specific places or similar in his/her community.
3. Next, on a piece of paper ask them to write the name of the building and draw three columns with the following headings: present energy consumption*, current/possible energy conservation ideas, future energy innovations/ideas. (* Inform them that they do not need to come up with consumption statistics, but list, for example, energy uses in a hotel such as power for lights, hot water, coffee makers, restaurant appliances, heating/air conditioning, laundry services, etc.)



Assessment

Challenge these groups of students to create an app or perform a rap! Ask each group to review their building energy conservation ideas and innovations and create one of the following:

A. Design your own app

There are apps for everything: Sound wave tattoo apps, devices that alert you if your food contains gluten, an app to walk a mile in a 16-year-old refugee's shoes, etc. Ask the students to strategize ways to improve energy efficiency and "design" an app with Indonesia's growing building market in mind. This could be an educational app that teaches people how to conserve energy at work or home, or it could be a more scientific app that turns off lights when everyone leaves the room. Encourage them to be creative:

- Brainstorm energy-saving ideas relevant for Indonesia's growing building market
- Choose an idea for your app
- Name and describe the app
- Describe the typical user
- Design one mockup of the main screen (brand name and logo, overview of notifications with design icons)
- Design another mockup of at least one other screen (energy usage bars, time control buttons, etc.)

Finally, using all of this information, have them design an advertisement for their app on poster board or on the computer, and share their app with the class.

B. Perform your own rap

This assignment is to strategize ways to improve energy efficiency, but instead of designing an app, students will compose and perform a rap with Indonesia's growing building market in mind. Encourage them to be creative. In order to get them started, share with them one or both of these energy raps:

Energy Rap

https://www.youtube.com/watch?v=4_vA6NgnwaA

Light Bulb Rap

<https://www.youtube.com/watch?v=J2y4P-6GfgY>

Ask student groups who choose this option to compose a 2- to 3-minute rap, distribute lyrics to classmates and then perform it.



LESSON FIVE

Pair with “East Asia: New Center of Global Energy and Related Issues” by Scott L. Montgomery

Introduction

The article paired with this lesson focuses on East Asia. It identifies this region as the “new center of demand for fossil fuels...(while) rapidly becoming the nexus for noncarbon energy too.”

Objectives

- Students will follow East Asia’s 21st-century path to become the global center of fossil-fuel demand while it simultaneously and quickly pursues developing renewable energies
- Students will wrestle with specific challenges facing China’s new role as the factory of the world
- Students will closely examine the stakeholders who greatly benefit and those who clearly suffer from China’s breakneck growth — and those who experience both the benefits and the repercussions

Focus Questions

- What are the causes and implications of East Asia being the new center of global energy?
- How do the Chinese tackle the dilemma over the demand for increased energy needs and the immediate need to clean up its water, air and soil?
- What are some of the most pressing energy challenges and opportunities in East Asia today? Who are the stakeholders?

Materials

- *The Seattle Times* article
- Computer/Internet access
- Handouts C-1, C-2 and C-3

Activities

Before reading

1. Ask students to review the primary sources of the world’s energy that were discussed the first week (oil, natural gas, coal, nuclear, hydropower, biomass, wind, solar, and geothermal). As you go through the above list, ask: “Is _____ a sustainable energy source?” Discuss why or why not.
2. The author writes that “China is unique for industrializing an economy of more than 1.3 billion people in a single generation. But the country has both benefited and suffered from such breakneck growth.” Ask students to reflect on what they have heard in the news about the dynamics (positive and negative) of China’s mind-boggling growth. What does it mean when China is called “the factory of the world”? Divide the class into small groups. Ask them to jot down “China Headlines” that they have seen or heard. Here are some examples to share/write on the board to get them started:
 - China is the fastest growing economy in the world
 - China is the world’s largest source of carbon emissions
 - China is the world’s largest consumer economy
 - China’s urbanization is the largest and fastest social movement in human history
 - China is the largest consumer of steel and cement
 - Hazardous levels of air pollution blanket Beijing and other major cities in China



During and after reading

1. As students read this week's article, ask them to underline important facts discussed in the article. These can be added to their "China Headlines" list.
2. Next, ask them to find and/or print out at least two articles that illustrate how China has benefited and/or suffered from such breakneck growth. Ask them to underline the stakeholders who have benefited from this growth and circle the stakeholders who have suffered from this growth. It is very possible that individuals or companies sometimes benefit *and* suffer. (Who are the *stakeholders*? These are people, companies and organizations that are affected by China's industrial revolution. They might include national and local government leaders, oil developers, coal miners, farmers, factory owners, factory workers, children, alternative fuel developers, environmentalists, pollution victims, tourists, and lawyers.) What are the most pressing challenges and opportunities discussed in each article they found? They may want to highlight these opportunities/benefits and challenges/costs in their articles with colored markers.

Assessment

China is unique for industrializing an economy of more than 1.3 billion people in a single generation. But quoting the author again: "The country has both benefited and suffered from such breakneck growth." In order for the students to grapple with some of the issues facing China, such as "How do the Chinese tackle the dilemma over the demand for increased energy needs and the immediate need to clean up its water, air, and soil?" this assignment challenges them to dissect a specific *or* broad energy or industrial project. It encourages them to "dig deep" and look at the significance of the project — including the benefits and costs to different stakeholders — and its current impact.

Divide the class into small groups (2-3 students per group), then distribute **Handouts C-1, C-2, and C-3** to each group. Ask them to choose an energy or industrial project or issue. It can either be a broad topic, as on **Handout C-1, "China as Factory of the World,"** or a specific project as on **Handout C-2, "The Three Gorges Dam."** Encourage them to reread *The Seattle Times* article, the list they compiled (China in the Headlines) and the articles that they each printed out from the Internet; then have each group choose one topic or issue. Again, they could tackle broad topics (China's solar or wind industry, Korea's nuclear power industry or Japan's expanding work on energy efficiency) or focus on one specific localized issue.

Have each group review the Handouts C-1 and C-2 as a guide for their research topic. Ask them to complete Handout C-3 and present their issue to the class.

Extracurricula

Encourage students to view one or more of the short documentaries found here:

<http://sites.asiasociety.org/chinagreen/>



LESSON SIX

Pair with “Conclusion” by Scott L. Montgomery

Introduction

The article paired with this lesson highlights the top energy issues facing Asia today — and reiterates that “the future of energy” will be decided in Asia. This lesson not only encourages students to recognize the importance of collaborative efforts but also challenges them to design their own environmental nongovernmental organization (NGO) from the perspective of concerned citizens living in Indonesia or Korea or any of the other countries of Asia.

Objectives

- Students will identify multiple stakeholders and recognize that each one has his/her own perspectives about problems and solutions
- Students will examine the importance of collaborative efforts to solve issues spanning borders
- Students will enumerate action plans and develop environmental NGOs

Focus Questions

- Are there ways for _____ (name a country in Asia) to continue to globalize and develop economically and still include all segments of society?
- What are some key strategies for dealing with environmental degradation in Asia?
- What environmental NGOs have been successful in Asia? Why? As circumstances change, what might be the focus of new ones?

Materials

- *The Seattle Times* article
- Computer/Internet access

Activities

Before reading

1. Write on the board: “Essential realities about energy in Asia today” and ask students to reflect on what they have learned and list these on the board. To get them going, copy this for the top of the list: “Asia has become the new center of global energy use encompassing both carbon and noncarbon sources.” Encourage them to review their notes and charts over the course of the past six weeks.
2. Considering these current realities, what might Asia’s energy and/or industrial future look like? Are there ways for _____ (name a country in Asia) to continue to globalize and develop economically and still include all segments of society? Add an adjoining list to the board: “Possible Action Plans/Collaborative Efforts.”



During and after reading

1. In this concluding article, the author illustrates his list of “essential realities about energy in Asia today.” Check to see if his list corresponds with the list on the board. Add any new ones to the board.
2. Divide the class into small groups of four or five students to discuss one of these three topics that the author highlights: (a) “Asia today is where the future of energy must be worked out. Germany, France or the United States is not a workable model for India, Japan or China. Most Asian nations import the greater portion of the energy sources they need. In the case of oil, the countries just mentioned vary in their import dependence from 65 percent for China to 75 percent for India and 98 percent for Japan. This dependence creates a high degree of energy insecurity.” (b) “The one traditional energy resource that Asia has in great abundance is coal. Large-scale use of this fuel has brought another set of problems, including elevated emissions and lethal air pollution. If there is any long-term benefit to the situation, it might be to force Asian nations to move more quickly toward noncarbon sources. Another key resource in the region, after all, is human capital. A number of countries in the region have the capability to advance renewable and nuclear technologies significantly.” (c) “Asia is now home to 17 of the world’s 31 megacities, defined as those with more than 10 million people. By 2040 the region is projected to have 30 or more such metropolitan areas. Well over half the world’s new buildings in the next three decades will be in Asia. Cities, whatever their size, never sleep and are the epicenters of economic activity and energy use. They demand a diversity of sources that can guarantee dependable supply at all times. If Asian countries can find ways to reliably power and provide mobility in their vast urban areas while reducing or even erasing the problems of carbon energy, they would contribute greatly to a better future for humanity.” Task each group to appoint a leader who will be in charge of facilitating each group discussion. Below are some questions he/she could use to get the discussion moving: List the possible stakeholders; what might be their various perspectives? What is the impact of growing energy use on the environment? What is the impact on the day-to-day life of the people? What might be possible future scenarios?

Assessment

As we conclude this six-week overview of “Global Energy Today: The Asian Nexus,” the students are constantly reminded that energy realities often include serious environmental degradation taking place in many corners of Asia as well as climate change issues affecting the entire globe.

This final assignment asks students to design their own environmental nongovernmental organization (NGO). They will choose a country in Asia and a specific environmental issue. They will also decide “who” they want to be. In other words, they cannot be an American setting up an NGO; they must be a concerned Asian citizen (they could choose a specific person such as a Japanese medical student, a Chinese solar power engineer, retired entrepreneurs from Indonesia or a broad group of concerned citizens from a country in Asia). Ask them to identify the issue and location, why it happened, who the stakeholders are and how an organization of dedicated people might help resolve the issue. Ask them to brainstorm organization goals and ideas for implementing these goals.

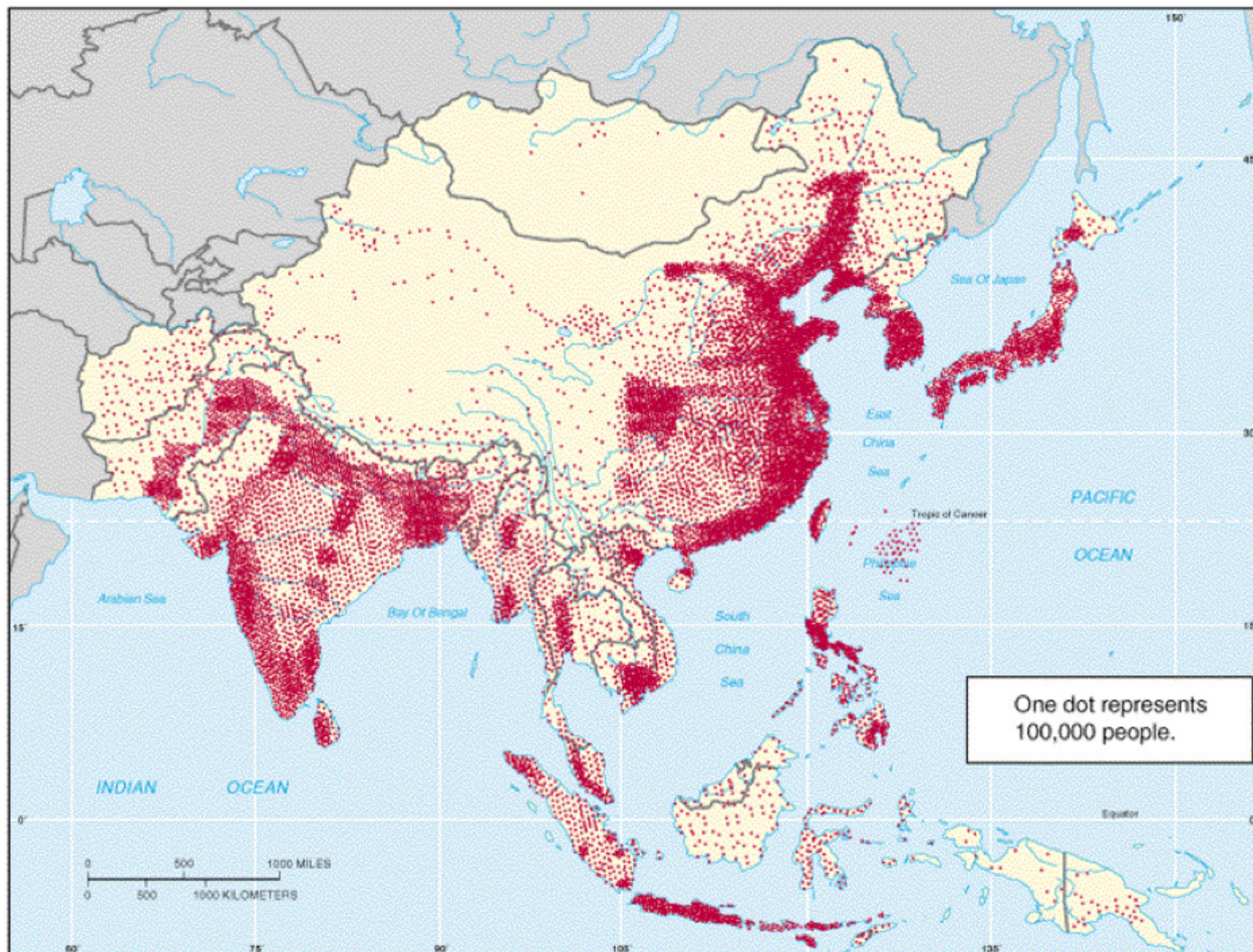
Finally, ask each group to design a trifold brochure or a website describing their NGO. Have them come up with a name, a mission, details about the population and region they will serve, projected impact on the problems and so forth. They may want to research other international or country-specific environmental organizations for ideas and guidelines. The NGO could focus on one or numerous goals (cleanup, education, health, renewable energy alternatives, lifestyle changes, innovative devices, collaborations, sustainability options, agriculture initiatives, green designs, etc.). Most students will probably have an environmental issue in mind after concluding this series of exercises. Whether they have an idea or still need an idea, encourage them to check out these three sites for excellent background information:

- **China Dialogue — China and the World Discuss the Environment** (includes article about other countries in Asia besides China):
<https://www.chinadialogue.net/>
- **YaleEnvironment360** — an online magazine offering opinion, analysis, reporting and debate on global environmental issues:
<http://e360.yale.edu/regions/asia>
- **The 14 Most Influential Sustainability NGOs:**
<http://www.sustainabilitydegrees.com/blog/most-influential-sustainability-ngos/>

When projects are complete, have each group share their organization with the rest of the class.

GLOBAL ENERGY TODAY: THE ASIAN NEXUS

HANDOUT A: POPULATION DISTRIBUTION IN ASIA



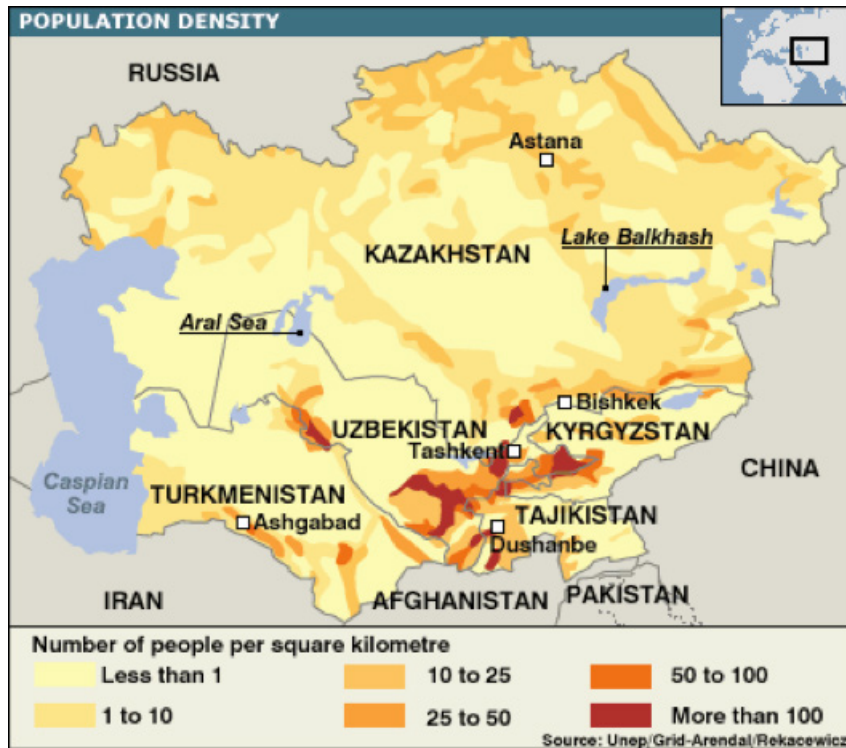
http://colinconley7.yolasite.com/resources/fig14-5_popdensity.GIF

Regions and Countries in Asia (Central Asia not included)

EAST ASIA	SOUTHEAST ASIA	SOUTH ASIA
China 1.4 billion	Brunei	Afghanistan
Japan	Burma (Myanmar)	Bangladesh
Macau	Cambodia	Bhutan
Mongolia	East Timor	India
North Korea	Indonesia	Maldives
South Korea	Laos	Nepal
Taiwan	Malaysia	Pakistan
	The Philippines	Sri Lanka
	Singapore	
	Thailand	
	Vietnam	

GLOBAL ENERGY TODAY: THE ASIAN NEXUS

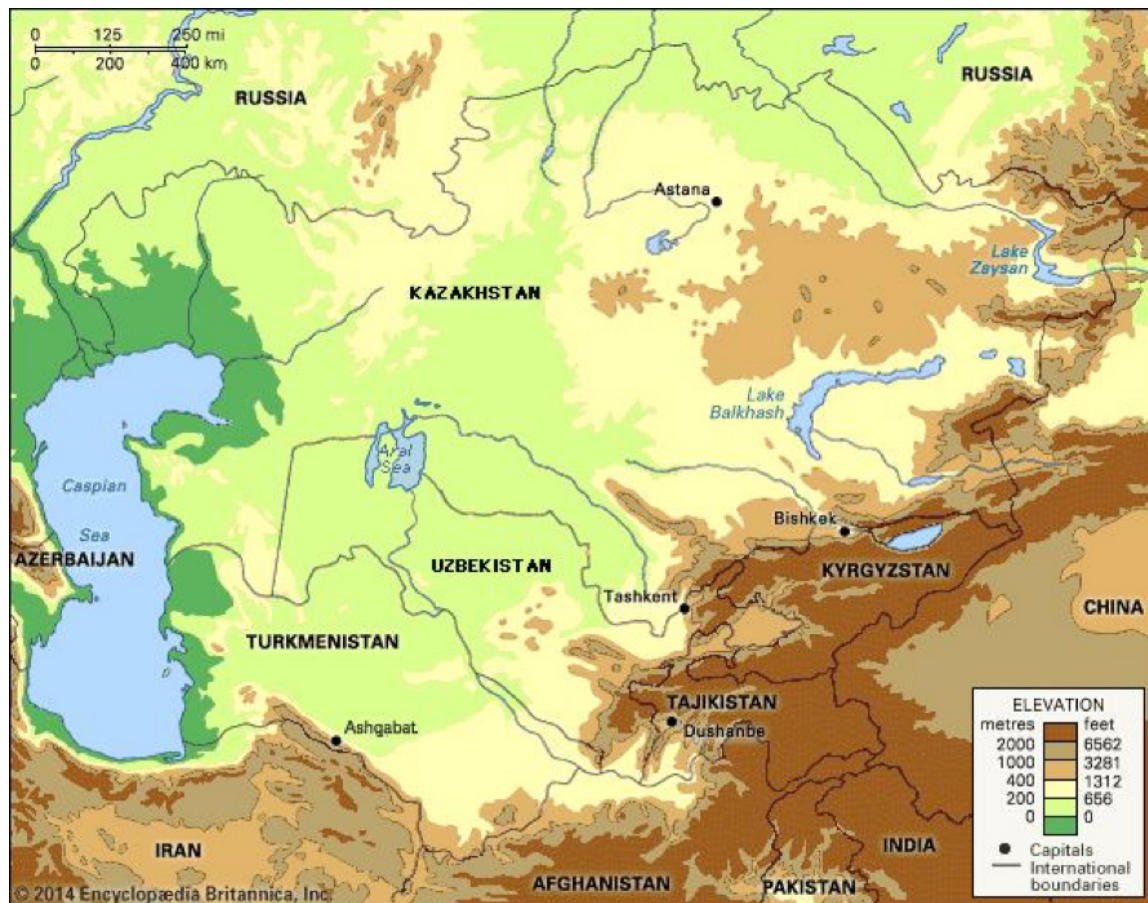
HANDOUT B: POPULATION AND RESOURCES



<https://media1.britannica.com/eb-media/40/7240-004-2F862B56.jpg>

THE "FIVE FORMER SOVIET COUNTRIES"

Kazakhstan (17 M)
Resources:
Agriculture:
Kyrgyzstan ()
Resources:
Agriculture:
Tajikistan ()
Resources:
Agriculture:
Turkmenistan ()
Resources:
Agriculture:
Uzbekistan ()
Resources:
Agriculture:



<https://media1.britannica.com/eb-media/40/7240-004-2F862B56.jpg>



HANDOUT C-1: POWERING UP CHINA/EAST ASIA (BROAD EXAMPLE)

Energy/Industrial Development Background

Shortly after Mao Zedong's death in 1976, Deng Xiaoping and other reformers moved to grow China's economy by instituting new "reform and opening" (*gaige kaifang*) policies. After more than three decades of spectacular growth, China has emerged as the so-called factory of the world. As the author says: "China is unique for industrializing an economy of more than 1.3 billion in a single generation."

What: Industrial giant: "factory of the world"	Who/stakeholders: The Chinese
Where: China	When: Over the past 3 decades plus

Significance of Energy/Industrial Development

(Note: These two lists are not parallel — this is a rough brainstorming list. Each column is not meant to correspond with the other.)

BENEFITS	COSTS
Growing middle class	Rising income gap
Growth of foreign trade	Growing number of migrant workers who are treated like second class citizens
Increase in consumer goods available to Chinese	Divided families; left-behind youth in the countryside
Inflow of foreign direct investment	Social unrest due to low pay, inadequate health care and education, land seizures, corruption, poor work and living conditions
According to the World Bank, gross domestic product (GDP) growth has lifted more than 800 million out of poverty.	Diminishing arable land due to growing industrialization and urbanization
Growing educational and employment opportunities	Growing power and water shortages
Global power	Serious environmental degradation; world's largest emitter of CO2
It is predicted that within the next two decades, the Chinese economy will surpass the US economy in overall size.	China has gone from one of the most egalitarian societies to one of the most stratified.

Position/Thesis on the Significance of the Energy/Industrial Development

(Include a general statement about the origin of this development and its current impact)

Since beginning market reforms in 1978, the People's Republic of China (PRC) has moved from a centrally planned economy to a more market-based one and has experience rapid economic and social development. China's astonishing growth is due to a number of reasons, including: China's move from a planned economy toward a market economy includes government encouragement and incentives for the population to work hard and "get rich quick"; a large (cheap) workforce; growing advances in education and technology; growth of rural and urban industries; "factory of the world" exports. According to the World Bank: "With a population of 1.3 billion, China is the largest economy and is increasingly playing an important and influential role in development and in the global economy. China has been the largest contributor to world growth since the global financial crisis of 2008."

<https://www.weforum.org/agenda/2016/12/the-world-s-top-economy-the-us-vs-china-in-five-charts/>



HANDOUT C-2: POWERING UP CHINA/EAST ASIA (SPECIFIC EXAMPLE)

Energy/Industrial Development Background

It has been said that the building of the Three Gorges Dam was the most ambitious project since the building of the Great Wall 2000 years ago. It has the world's largest instantaneous generating capacity, channeling energy to fuel China's rise as a great economic world power.

What: The Three Gorges Dam	Who/stakeholders: Chinese engineers, industrialists, politicians, farmers, consumers, etc.
Where: China's Yangzi (Yangtze) River	When: Begun in 1994; completed in 2012

Significance of Energy/Industrial Development

(Note: These two lists are not parallel – this is a rough brainstorming list. Each column is not meant to correspond with the other.)

BENEFITS	COSTS
Generate electricity to help solve energy shortage	1.3 million people relocated; 13 cities, 140 towns and 1,350 villages flooded or partially flooded.
Reduce consumption of coal and carbon dioxide emissions; also compared to trucking, barges reduce CO2 emissions and operate at lower costs	Sedimentation hinders electrical generation and fills Chongqing's deep harbor; absence of silt downstream causes serious effects.*
Irrigation systems expanded	Pollution caused by abandoned factory effluents and raw sewage are creating a polluted reservoir
Navigation and shipping enhanced to allow larger ships to journey as far as Chongqing	Plant and aquatic species endangered; Chinese river dolphin (baiji) now extinct
Flood protection	Increased risk of landslides
Still a scenic river trip; more tributaries open to explore by boat	The once gorgeous Three Gorges is not longer as spectacular in high water
Some archaeological sites were moved and new archaeological finds were unearthed and saved	More than 1,000 archaeological and historic sites were submerged (some moved, but some lost).
Some more thought given to new dam projects/lesson learned	Earthquake safety issues; about 360 million live within the watershed of the river

Position/Thesis on the Significance of the Energy/Industrial Development

(Include a general statement about why this energy/industrial project was instituted and its current impact)

Seeking to produce clean energy and control floods, China embarked on the building of a huge engineering feat in 1994. Today the world's most powerful dam is channeling the Yangzi's raw energy into hydroelectric power, fueling part of China's industrial revolution and irrigating her central breadbasket. This dam today generates a yearly energy production capacity of 84 kilowatt-hours (Kwh), the equivalent generating capacity of 50 million tons of coal, 25 million tons of crude oil or 18 nuclear power plants. Note: Although originally expected to provide 10 percent of China's power, energy demand has skyrocketed in the past decade. On average, it supports only 1.7 percent.

Note: A series of dams upstream have been completed/are being built upstream to cut down on sedimentation.



HANDOUT C-3 (STUDENT WORKSHEET): POWERING UP CHINA/EAST ASIA (_____ EXAMPLE)

Energy/Industrial Development Background

What:	Who/stakeholders:
Where:	When:

Significance of Energy/Industrial Development

(Note: These two lists do not need to be parallel – this is a rough brainstorming list. Each column is not meant to correspond with the other.)

BENEFITS	COSTS

Position/Thesis on the Significance of the Energy/Industrial Development

(include a general statement about why this energy/industrial development occurred).



Continue learning and teaching about Asia with “Exploring Asia,” a project of the Asia and Global Studies outreach centers in the Henry M. Jackson School of International Studies.

The centers sponsoring “Exploring Asia” at the Henry M. Jackson School of International Studies in the University of Washington are:

- East Asia Center
- East Asia Resource Center
- Ellison Center for Russian, East European and Central Asian Studies
- Center for Global Studies
- South Asia Center
- Southeast Asia Center