POPULATION MODULE OVERVIEW

SKILL FOCUS

Spatial Relationships, Data Analysis, Scale Analysis

Spatial Relationships: Describe spatial patterns and networks, and explain a likely outcome in a geographic scenario using geographic concepts, processes, models, or theories.

Data Analysis: Explain patterns and trends in maps and in quantitative and geospatial data to draw conclusions.

Scale Analysis: Identify the scale of analysis presented by maps, quantitative and geospatial data, images, and landscapes

CONTENT Enduring Understanding SPS-2

Changes in population have long- and short-term effects on a place's economy, culture, and politics.

Topic 2.9. Aging Populations

Topic 2.7. Population Policies

How does scale affect our analysis of geographic trends?

CLASS ACTIVITY

Identify and Analyze Demographic Trends and Scales of Analysis

Students will identify and analyze demographic statistics at different scales of analysis and work collaboratively to predict challenges presented by those trends.

AP SKILL ALIGNMENT

Skill Category 2.A. Describe spatial patterns, networks, and relationships.

Skill Category 3.C. Explain patterns and trends in maps and in quantitative and geospatial data to draw conclusions

Skill Category 5.A. Identify the scales of analysis presented by maps, quantitative and geospatial data, images, and landscapes

What challenges are presented by an aging population?

CLASS ACTIVITY

Analyzing Population Policies in South Korea

Students will identify and analyze antinatalist and pronatalist population policies in South Korea and apply their knowledge to explain why a society may want to promote or discourage population growth.

AP SKILL ALIGNMENT

Skill Category 2.C. Explain a likely outcome in a geographic scenario using geographic concepts, processes, models, or theories.

Skill Category 3.E. Explain what maps or data imply or illustrate about geographic principles, processes, and outcomes.

Assessment

CLASS ACTIVITY

Concept Mapping and AP-Aligned Assessment

Students will connect vocabulary and concepts via a concept-mapping activity and then demonstrate understanding as they answer five Multiple Choice Questions (MCQs) and one Free Response Question (FRQ) with two stimuli.

AP-ALIGNED ASSESSMENT

Free-Response Question (FRQ) and Multiple Choice Questions (MCQs)

POPULATION MODULE SOURCES

Stimulus Type	Description	Page
Population Pyramid	East Asia Population, 2020	28
Population Pyramid	Projected East Asia Population, 2050	28
Data Chart	East Asia Demographic Indicators	28
Population Pyramid	Population of South Korea, 2020	29
Population Pyramid	Projected Population of South Korea, 2050	29
Data Chart	South Korea Demographic Indicators	29
Мар	Average Projected Annual Rate of Population Change (%), World Map, 2020-2025	30
Population Pyramid	World Population, 2020	31
Population Pyramid	Projected World Population, 2050	31
Data Chart	World Demographic Indicators	31
Graph	Fertility Rates, Selected South Korea Provinces, 2017	32
Мар	Ratio of Elderly Population in South Korea by Province, 2010	32
Population Pyramid	Seoul, 2010	32
Population Pyramid	Jeollanam-do, 2010	32

Stimulus Type	Description	Page
Population Pyramids	South Korea, 1965, 1975, 1995, 2015	39
Poster	Antinatalist South Korean Government Poster	43
Poster	Antinatalist South Korean Government Poster	43
Text Excerpt	South Korea's Child Care Policy	43
Graph	South Korea's Total Fertility Rate, 1960-2018	44
Text Excerpt	Field Note About Changing Family Sizes in Korea	44
Text Excerpt	Korea Endorses Loop for Birth Control	44
Text Excerpt	Government Support for Housing For Families With 3+ Children	45
Poster	Antinatalist South Korean Government Poster	45
Poster	Antinatalist South Korean Government Poster	45
Graph	Percentage of South Korean Women Using Contraception (Ages 15-49)	46
Text Excerpt	South Korea's Saero-Maji Pronatalist Plan	46

Stimulus Type	Description	Page
Population Pyramid	Population of South Korea, 2020	58
Text Excerpt	"U.S. Homes Problematic for Aging Population"	58
Graph	Total Fertility Rate of South Korea Since 1984	58
Мар	Average Projected Annual Rate of Population Change (%), World Map, 2020-2025	59
Population Pyramid	Projected East Asia Population, 2050	59

DAY 1



How does scale affect our analysis of geographic trends?

AP CURRICULUM FRAMEWORK REFERENCE

Enduring Understanding

SPS-2. Changes in population have long- and short-term effects on the economy, culture, and politics of places. **Topic 2.9**. Aging Populations

HUMAN GEOGRAPHY SKILLS

Spatial Relationships: Analyze geographic patterns, relationships, and outcomes in applied contexts. Skill Category 2.A. Describe spatial patterns, networks, and relationships.

Scale Analysis: Analyze geographic theories, approaches, concepts, processes, and models across geographic scales to explain spatial relationships.

Skill Category 5.A. Identify the scales of analysis presented by maps, quantitative and geospatial data, images, and landscapes.

OVERVIEW

Students will explore population pyramids and maps showing aging populations at different scales to identify trends in the demographic data, as well as determine which scale of analysis is best for understanding the population dilemmas created by those trends. Students will also predict possible economic, social, and political consequences for a country that is aging.

MATERIALS NEEDED:

- Butcher paper or its equivalent (chart paper, extra-large sticky notes)
- Markers or colored pencils
- Day 1 Handouts
 - ▷ Scale of Analysis Homework (p. 22)
 - Day 1 Student Handout (1 per student) (pp. 23–24)
 - Vocabulary Sorting Cards (2 sets per group). These will need to be cut out in advance (p. 25)

- Metacognition Cards (p. 25)
- ▷ Definition Cards (p. 26)
- ▷ Vocabulary Answers Key (p. 27)
- ▷ Data Set #1 (1 set per group) (p. 28)
- ▷ Data Set #2 (1 set per group) (p. 29)
- ▷ Data Set #3 (1 set per group) (p. 30)
- ▷ Data Set #4 (1 set per group) (p. 32)

SEQUENCE OF INSTRUCTION

HOMEWORK OVERVIEW

HOMEWORK OPTION 1: AGING POPULATIONS

- Reading: "The Ageing Population" (https://tinyurl.com/economicsHW)
- Using a copy of "The Ageing Population" students use the CAMS reading strategy below to process the information that they read:
 - ▷ Step 1: "C" *Circle* unfamiliar words and phrases.
 - ▷ Step 2: "A" Add synonyms for the circled words and phrases.
 - Step 3: "M" Using Metacognitive markers, students annotate the text and use metacognition (awareness and understanding of one's own thought process). Students keep note of their thoughts by using symbols such as *, ?, !, to mark their ideas, guestions, comments, and underline key ideas.
 - \triangleright Step 4: "S" Stop and Jot in the margin. Summarize the reading and make notes next to the metacognitive markers.

HOMEWORK OPTION 2: SCALE OF ANALYSIS

- Homework Option 2 is designed for students who have not been introduced to the concept of scale, or who might find a brief review of the concept helpful as an introduction.
- Using the Scale of Analysis Homework handout on p. 22, students will work through several tasks to understand scale.

TEACHER NOTES

It is important that students understand and can apply the vocabulary needed for Day One of this activity. If you feel that your students need more vocabulary practice before they start the Day One activities, have them create a Frayer box for each of the terms using the structure below. This could be an optional extension activity to the Homework. Key vocabulary includes the following terms:

- Fertility Rates
- Aging Population
- Mortality Rates Life
 - Expectancy Immigration
 - Policies
- Pronatalist Policies
- Antinatalist Policies
- Replacement level



TEACHER NOTES

When using the "CAMS" Strategy it is important that you demonstrate using this strategy by reading at least two paragraphs as a class to model the strategy.



TEACHING TIP

This activity is the culmination of demographic study and would best follow after students have studied AP Human Geography Population Topics 2.1-2.6 and 2.8.

- Migration Rates
- Dependency Ratio

CLASS ACTIVITY 1 OF 4: WARM UP/INTRODUCTION

WARM UP/INTRODUCTION (5 MINUTES): VOCABULARY SORT

ACTIVITY 1

To check that students understand key demographic vocabulary, students will interact with key vocabulary in a sorting activity.

ACTIVITY PROCEDURE

- ▶ Distribute the Day 1 Student Handout (pp. 23–24) to all students.
- Group students in groups of four and assign a number, one through four, to each group member.
- ▶ Distribute the vocabulary term sorting cards (p. 25), giving two sets to each group.
- Communicate that the students assigned numbers 1 and 3 will be partners and students assigned numbers 2 and 4 will be partners.
- Students use the metacognition cards (p. 25): "I know this definition", "I think I know this definition", and "I don't know this definition" and separate the cards into three stacks.
- Groups use the vocabulary term sorting cards (p. 25) and sort them under the metacognition card that is most appropriate.
- Students then view the definition cards (p. 26) and match the definition to the appropriate term card.
- After students believe they have all definitions correct, use the Vocabulary Answers Key (p. 27) to determine if any terms are incorrect. If any terms are incorrectly paired, inform students how many incorrect matches they have and ask them to re-sort. Follow the previous step until the students are correct or warm-up time is complete.
- Debrief the activity with students, focusing on which terms they found confusing and which terms they found easy to understand and why.
- Require students to write down any terms they struggled to understand on their Day 1 Student Handout.

TEACHER NOTES

The vocabulary activity provides a quick formative check of understanding of key vocabulary, but if students have already mastered the key demographic vocabulary in the warm-up, teachers can begin with Activity 2.



TEACHING TIP

Students often do not struggle to understand the definitions of these particular terms, but often struggle with the implications of these measures. Remind them to focus on understanding the effects as well as the definition.

CLASS ACTIVITY 2 OF 4: DEMOGRAPHIC TRENDS AND SCALE OF ANALYSIS

CLASS ACTIVITY (30 MINUTES): IDENTIFYING TRENDS AT DIFFERENT SCALES OF ANALYSIS

ACTIVITY 2

Students will interact with demographic information in the form of population pyramids, maps, and charts to determine trends at different scales. Group members will analyze similar data at different scales and share information using a sentence stem protocol which encourages elaboration and also helps students who may struggle with speaking in front of others to present information. Groups will then determine at which scale the South Korea population concerns can best be understood.

ACTIVITY PROCEDURE

- If starting with Activity 2, group students into groups of three or four, and assign numbers 1-4 to each student. Otherwise, keep the groups and numbering from Activity 1; give each student the Data Set Handout that corresponds to their number: Data Set 1, 2, 3, or 4.
- On the Day 1 Student Handout, students individually answer the following questions on the first page of the Handout:
 - What is the scale of analysis shown in this data? What are two pieces of evidence to support your answer?
 - What trend(s) do you see in the data? What are at least two pieces of evidence to support your answer?
- Each student will share information using the following sentence stems to encourage depth of conversation:
 - ▷ "The scale of analysis for my data is . . . because of . . . and . . . "
 - If students need additional scaffolding, provide students with terms such as "large scale," "small scale," "global level," "regional level," "state level," and "sub-state level."
 - ▷ "One trend that can be found in the data is ... because of ... and ..."
 - If students need additional scaffolding, provide them with the following questions:
 - » What information is being shown in the data sets?
 - » What, in general, do all the data sets have in common?
- ▶ Teachers can monitor these group conversations and correct any misconceptions.
- Debrief:
 - ▷ As a whole class, explain at which scale of analysis each handout is focused:
 - Data Set #1: East Asia-Regional Level
 - Data Set #2: Republic of Korea—Country or National Level
 - Data Set #3: Global Population—Global Level
 - Data Set #4: Political Divisions in South Korea-Local or Sub-state Level
 - Have some of the students share the trends they noted and explain what in the data led them to their conclusions.
 - Focus students on the aging population in East Asia and particularly what is occurring in South Korea.
 - ▷ Have each group select which scale they think would be most helpful for understanding the aging of the Republic of Korea's population and explain their reasoning.
 - Explain to students that the elder dependency ratio would be high for a country like South Korea.

- Choose one group and have them identify the scale they think would be most helpful to share with the class.
- After hearing that group's choice, ask the other groups if they agree or disagree with the conclusion presented. Encourage the other groups to present evidence and an argument why they either agree or disagree with the first group.
 - » Try to identify one group that agreed with the findings and one that disagreed with the findings.



TEACHING TIP

Scale can be discussed with students as analogous to looking at a picture. The smaller the area of a picture we focus on, the more detail we see. Thus, when looking at a global scale we do not see local variations, which may be important in making geographical decisions. As the scale of analysis narrows, more detailed information comes into focus which can be studied.

TEACHER NOTES

Students may struggle to understand the Dependency Ratio and related implications. The Dependency Ratio is the ratio of those too young (14 and under) or too old (65 and up) to support themselves versus those who are in their productive economic years. When there is a high youth dependency, countries must devote significant resources to education and youth services. When there is a high elder dependency, countries must devote significant resources to social security, health care, and other elder services. This places a stress on the working-age population and economy.

CLASS ACTIVITY 3 OF 4: PREDICTING CHALLENGES FOR AN AGING POPULATION

CLASS ACTIVITY (20 MINUTES): IDENTIFYING CHALLENGES

ACTIVITY 3

Students will brainstorm economic, social, and political consequences for a country with an aging population or high elder dependency ratio. Each group will create their own list of consequences and then analyze other groups' ideas to develop a master list of consequences.

ACTIVITY PROCEDURE

- Students remain in the same groups.
- On a poster or butcher paper, students take five minutes to brainstorm the most important economic, social, and political consequences of an aging population. Students write these down on their Day 1 Student Handout.
- Groups rotate to look at other group predictions and add any new examples on their Day 1 Student Handout:
- Debrief with students:
 - "What were the most common consequences identified?" Students will be able to easily identify these as they will have the greatest number of tally marks.
 - "What was one consequence, from another group, that you thought was insightful? Explain the reason why."
- Possible consequences:

Political	Economic	Social
 Shifting demographics cause voters to have different priorities (social safety net vs. schools, etc.) 	 Shrinking workforce Shrinking consumer base Shrinking economy 	 How to provide for an aging population (social programs) Closing schools Closing colleges (Lack of access outside of large cities)

CLASS ACTIVITY 4 OF 4: CHECK FOR UNDERSTANDING - EXIT TICKET

EXIT TICKET (5 MINUTES): AGING POPULATION ANALYSIS

ACTIVITY 4

Students will demonstrate what they have learned on day 1 through a Quick Write.

ACTIVITY PROCEDURE

Have students write a paragraph that describes the causes of an aging population, using at least one economic, social, and/or political consequence of aging populations. Have students include in their paragraph a discussion of what scale of information would be most helpful in understanding the causes and consequences of aging for any state and why that scale would be most useful.

HOMEWORK SCALE OF ANALYSIS

Name: _



Period:___

Answer the following questions using the map on the left:

- What would happen if you were to click the + button?
- Would this view be considered small or large scale? Why?
- What would happen to the map if you were to click the – button?
- Would this view be considered small or large scale? Why?

Zooming in and zooming out describes *map scale*. Large-scale maps show smaller areas with more details, while small-scale maps show larger areas with fewer details. In addition to map scale, the *scale of analysis* can also be analyzed. Scale of analysis relates to the level of the data (also sometimes called data aggregation). Scale of analysis can relate not only to maps, but also to charts, pyramids, etc. In other words, I can take a world map and break the data down to the world regional level or, using the same map, I could break the data down to the country level. *Changing the scale of analysis can lead to different conclusions regarding the patterns presented*.

DIRECTIONS

Using the spectrum below (similar to a timeline), identify the varying levels of scale of analysis from smallest to largest scale. After placing the regions, write a brief justification for your placement under each level of data.

- East Asia: Region
- South Korea: National or State Level
- Global Population: Global Level
- Political Divisions in South Korea: Sub-state or Local Level



DAY 1 STUDENT HANDOUT

Name:	Period:
VOCABULARY WARM-U	P
Which terms am I still struggling to understand?	How will I better remember this term?

DEMOGRAPHIC TRENDS AND SCALE OF ANALYSIS

For your assigned data set, answer the following questions:

1. What is the scale of analysis shown in this data? What are two pieces of evidence to support your answer?

2. What trend(s) do you see in the data? What are at least two pieces of evidence to support your answer?

Use the following sentence stems as you present to your group:

- ▶ The scale of analysis for my data is ... because of ... and ...
- ▶ One trend that can be found in the data is ... because of ... and ...

Which scale of analysis does your group think would most accurately allow you to understand population aging in the Republic of Korea? Why? (Be prepared to share your answer with the class.)

PREDICTING CHALLENGES FOR AN AGING POPULATION

What consequences did your group identify to be the most important for a country with an aging population?

	POLITICAL	ECONOMIC	SOCIAL
Consequences My Group Identified			
Consequences Other Groups Identified			

VOCABULARY TERM SORTING CARDS

Fertility Rates	Mortality Rates
Migration Rates	Dependency Ratio
Aging Population	Life Expectancy
Immigration Policies	Pronatalist Policies
Antinatalist Policies	Replacement Level

METACOGNITION CARDS

I know	I think I know
this definition	this definition
I don't know this definition	

DEFINITION CARDS

Number of immigrants/1000 - the number of emigrants/1000	The number of deaths per 1000 people per year
The ratio of the number of people who are either too young (0-14) or old (65+) to support themselves to those who can support themselves	Due to declining birth rates and increase in life expectancy, the ratio of people over 60 to the total population is increasing
The average number of years a person is predicted to live	Policies designed to encourage or discourage immigration
Policies designed to increase birth rates; sometimes referred to as expansive policies	Policies designed to decrease birth rates; sometimes referred to as restrictive policies
The level of fertility needed to maintain the current population—a Total Fertility Rate (TFR) of 2.1. With a TFR lower than 2.1 the total population will shrink; with a TFR above 2.1 the total population will grow.	The average number of children that a woman will have in her lifetime

VOCABULARY ANSWERS KEY

Term	Definition
Fertility Rates	The average number of children that a woman will have in her lifetime
Mortality Rates	The number of deaths per 1000 people per year
Migration Rates	Number of immigrants/1000 - the number of emigrants/1000
Dependency Ratio	The ratio of the number of people who are either too young (0-14) or old (65+) to support themselves to those who can support themselves
Aging Population	Due to declining birth rates and increase in life expectancy, the ratio of people over 60 to the total population is increasing
Life Expectancy	The average number of years a person is predicted to live
Immigration Policies	Policies designed to encourage or discourage immigration
Pronatalist Policies	Policies designed to increase birth rates; sometimes referred to as expansive policies
Antinatalist Policies	Policies designed to decrease birth rates; sometimes referred to as restrictive policies
Replacement Level	The level of fertility needed to maintain the current population—a Total Fertility Rate (TFR) of 2.1. With a TFR lower than 2.1 the total population will shrink; with a TFR above 2.1 the total population will grow.



East Asia Population, 2020 Source of data: United States Census Bureau - International Data Base. (n.d.). Retrieved March 28, 2019, from https://www.census.gov/ data-tools/demo/idb/region.php?N=%20Results%20&T=10&A=both-&RT=0&Y=2020&R=121&C=, Mid-year Population by Five Year Age Groups and Sex - East Asia



Projected East Asia

Population, 2005 Source of data: United States Census Bureau - International Data Base. (n.d). Retrieved March 28, 2019, from https://www.census.gov/ data-tools/demo/idb/region.php?N=%20Results%20&T=10&A=both-bRT=0&Y=2050&R=121&C=, Mid-year Population by Five Year Age Groups and Sex - East Asia

East Asia Demographic Indicators Source of data: United States Census Bureau - International Data Base. (n.d.). Retrieved March 28, 2019, from https://www.census.gov/data-tools/demo/idb/region.php?N=%20Results%200F=130A=both@RT=00Y=20500R=121@C=

	2005	2015	2025	2050
Population Growth Rates	.5	.5	.1	06
Fertility Rate	1.5	1.6	1.6	1.6
Life Expectancy	74	75	77	81



Population of South Korea, 2020

Source of data: United States Census Bureau - International Data Base. (n.d.). Retrieved March 28, 2019, from https://www.census.gov/ data-tools/demo/idb/region.php?N=%20Results%206T=106A=sepa-rate@RT=06Y=20206R=1216C=KS, Mid-year Population by Five Year Age Groups and Sex - South Korea



Projected Population of South Korea, 2050

Source of data: United States Census Bureau - International Data Source of data. Online of States Certistis Bureau - International Data Base. (n.d.). Retrieved March 28, 2019, from https://www.cersus.gov/ data-tools/demo/idb/region.php?N=%20Results%20&T=10&A=sepa-rate&RT=0&Y=2050&R=121&C=KS, Mid-year Population by Five Year Age Groups and Sex - South Korea

South Korea Demographic Indicators Source of data: United States Census Bureau - International Data Base. (n.d.). Retrieved March 28, 2019, from https://www.census.gov/data-tools/demo/idb/region.php?N=%20Results%200F=136A=both6RT=00Y=20500R=1218C=

	2005	2015	2025	2050
Population Growth Rates	.2	.6	.2	9
Fertility Rate	1.1	1.2	1.3	1.6
Life Expectancy	78	82	83	84

Average Projected Annual Rate of Population Change (%), World Map, 2020–2025 ©2019 United Nations, DESA, Population Division. Licensed under Creative Commons license CC BY 3.0 IGO. Data source: United Nations, DESA, Population Division. *World Population Prospects 2019*. http://population.un.org/wpp/maps/





World Population, 2020 Source of data: United States Census Bureau - International Data Base. (n.d.). Retrieved March 28, 2019, from https://www.census. gov/data-tools/demo/idb/region.php?N= Results &T=10&A=both-&RT=0&Y=2020&R=1&C=, Mid-year Population by Five Year Age Groups and Sex - World



Percent of Population

Projected World Population, 2050

Source of data: United States Census Bureau - International Data Base. (n.d.). Retrieved March 28, 2019, from https://www.census.gov/ data-tools/demo/idb/region.php?N=%20Results%200T=108A=both-&RT=0&Y=2050&R=1&C=, Mid-year Population by Five Year Age Groups and Sex - World

World Demographic Indicators Source of data: United States Census Bureau - International Data Base. (n.d.). Retrieved March 28, 2019, from https://www.census.gov/data-tools/demo/idb/region.php?N=%20Results%20&T=13&Deth&RT=0&Y=2050&R=1&C=

	2005	2015	2025	2050
Population Growth Rates	1.1	1.1	.9	.5
Fertility Rate	2.5	2.4	2.3	2.2
Life Expectancy	66	69	71	77

Ages



Ratio of Elderly Population in South Korea by Province, 2010



Source of data: The National Atlas of Korea III - Retrieved March 28, 2019, from http://nationalatlas.ngii. go.kr/pages/page_852.php, Societal Evolution and Aging Population: The Elderly Population: Ratio of Elderly Population (Aged 65 or older, 2010)



MALE FEMALE $\begin{array}{c} 100\\ 95-99\\ 90-94\\ 85-89\\ 80-84\\ 75-79\\ 70-74\\ 65-69\\ 50-54\\ 45-49\\ 40-44\\ 35-39\\ 30-34\\ 25-29\\ 20-24\\ 15-19\\ 10-14\\ 5-9\end{array}$ Ages 0-4 5 4 3 2 1 0 1 2 3 4 5 Percent of Population

Jeollanam-do, 2010



Fertility Rates, Selected South Korea Provinces, 2017

Source of data: Fertility rates in Korea in 17 provinces and cities. Retrieved March 28, 2019, from https://www.theatlas.com/charts/ Hyl2PuUAG