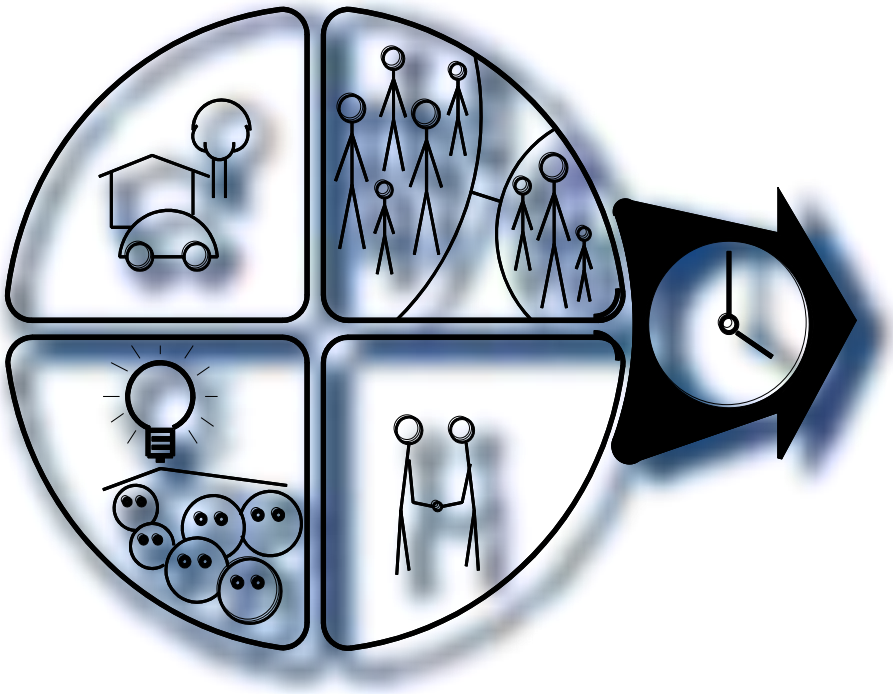
Introduction to
Systems

Social Studies
Humanities
Science



Part 4

Demographics &
Setting

Marion Brady and Howard Brady

Introduction to Systems

Originally "*Connections: Investigating Reality*"

Part 4: Demographics and Setting

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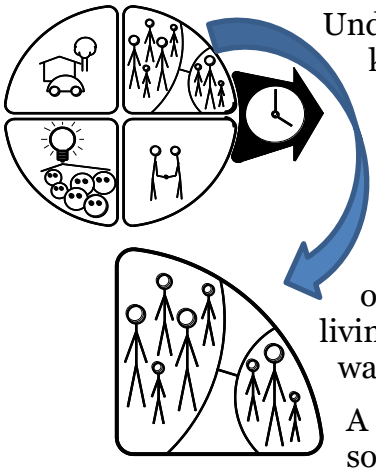
Model Category: Demographics



Understanding a particular event, situation or society requires some knowledge of the people involved—how many, how they're geographically distributed, the number of young and old, how the numbers are changing, and so on. Study of this kind of information is called "Demographics."

For example, in an area where neighbors live miles apart, it probably doesn't matter much if they throw their garbage or other waste in a stream. But if there are several thousand people living close together along that stream, all using it to dispose of waste, it matters a great deal.

A change in Demographics change can—and often does—change societies. Change the number of people, or how they're distributed, and their society and culture almost certainly will change, sometimes in surprising ways.

Of special importance in understanding an event, situation or society:

- Total population
- Population density
- Population distribution
- Age distribution
- Ratio of males to females
- Changes in any of the above due to births, deaths, health factors, migration
- Subgroups: ethnic, religious, occupational, social class, and so on. The above demographic analytical categories may also be used to analyze subgroups. Subgroups may differ from the main group in Shared Ideas, Action Patterns and Setting.

When a society changes, the triggers for the changes are, almost always, either *Setting* (including technology) or *Demographics*. These two parts of the Model are "**Change Factors**," the focus of investigations in Part 4.

Investigation: Demographics/Population Change

Demographic changes can affect the cost of food, how hard it is to get a job or find a place to rent, who runs the country, and much, much else that's probably important to you. We'll look at some of the trends happening right now.

The table below shows estimated populations of North America and the world at several points in the past.[1]

1: Make a line graph showing the information.

	Year and estimated population (millions)									
	1500	1600	1700	1750	1800	1850	1900	1950	1999	2016
World:	590	660	710	790	980	1,300	1,700	2,500	6,000	7,400
North America:	6	3	2	2	7	26	82	172	312	579

2: Based on the graph, extrapolate (project out, based on trends) the population of North America and the world in 2030 and 2050.

3: Identify and list possible problems or changes that could affect future population levels. (You may wish to add to this list based on the following investigations.)

Investigation: Population Pyramids

Population experts often show the ages of members of a population in a type of graph called a "population pyramid." The population pyramid on the next page shows the United States age distributions in 1970:

1: The second box provides data for population of the U.S. in 2016. ***Draw a population pyramid showing this data.***[2]

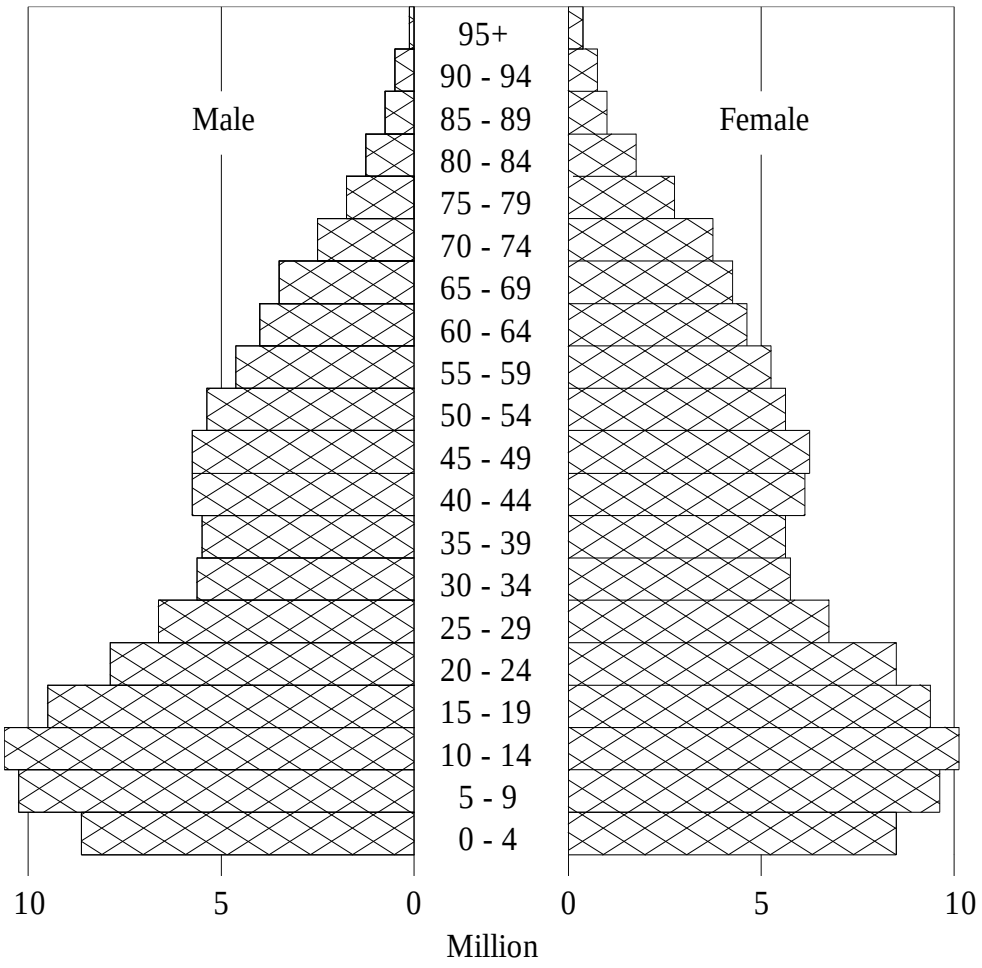
2: In your journal, identify and describe similarities and differences between the two population pyramids.

3: World War II ended in 1945. After the war, the U.S. had what is usually called "the baby boom." Returning soldiers married and started raising families, and the population rapidly increased. ***What effects did the "baby boom" have on the 1970 pyramid? On the 2012 pyramid? Mark your pyramid to show the baby boom.***

(Continued)

[1] https://en.wikipedia.org/wiki/World_population

[2] Pyramid and table data: U.S. Bureau of the Census. Refer to www.census.gov/population



◄ U.S., 1970

U.S., 2016 ►

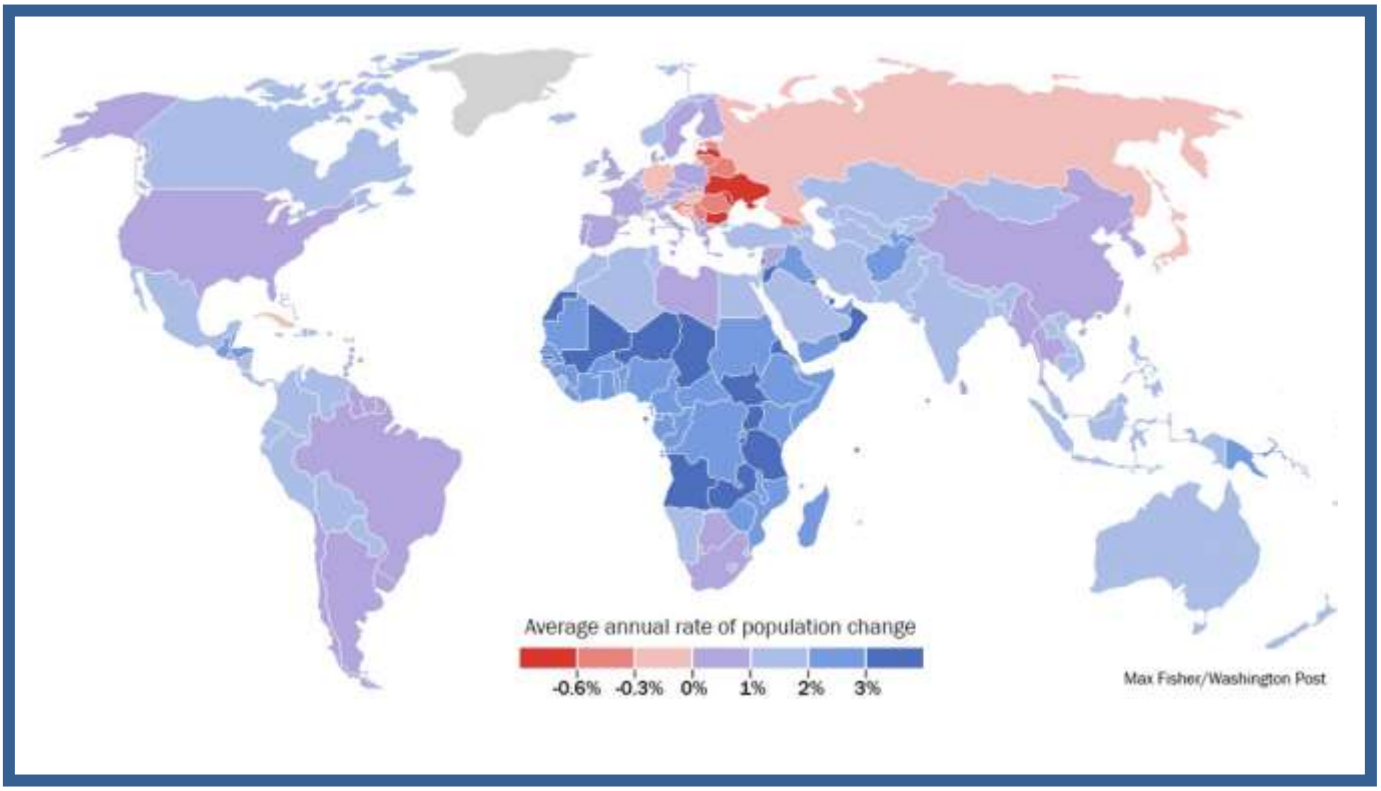
(Population in thousands)

Age	Male	Female	Age	Male	Female
Under 5	10,319	9,882	**45 to 49**	11,209	11,500
5 to 9	10,390	9,959	**50 to 54**	10,933	11,364
10 to 14	10,579	10,097	**55 to 59**	9,524	10,141
15 to 19	10,304	10,737	**60 to 64**	8,078	8,740
20 to 24	11,014	10,572	**65 to 69**	5,053	6,583
25 to 29	10,636	10,466	**70 to 74**	4,244	5,034
30 to 34	9,997	9,966	**75 to 79**	3,182	4,135
35 to 39	10,042	10,138	**80 to 84**	2,294	3,449
40 to 44	10,394	10,497	**85 and over**	1,790	3,704

4: Identify and describe effects baby boomers had—and are having—on American life as they passed through various ages. (For example, how and when were schools affected? What were/are later effects?)

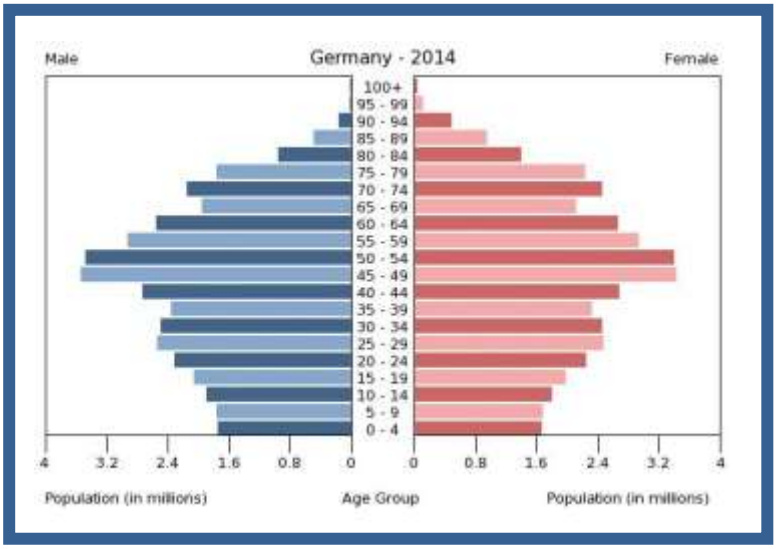
Investigation: World Population Trends

On the map below, blue countries have expanding populations; those in red or pink are shrinking. Purple ones are growing slowly or not at all. Data source: United Nations Population Fund. Countries with shrinking population include Germany, Russia, South Korea and Japan—all countries with major economic effects on the rest of the world.



https://www.washingtonpost.com/news/worldviews/wp/2013/10/31/how-the-worlds-populations-are-changing-in-one-map/?utm_term=.5fbe23569072

Do the differences matter? ***Study the population pyramid for Germany. (Pyramids for Korea and Japan are similar.) What caused this shape? What problem will German manufacturers have in a few years? What effects will this have on Germany and the world? Discuss this and record your conclusions and hypotheses in your journal.*** (Continued next page)



In many African and Middle Eastern countries, populations are growing rapidly. ***What problems are created by rapid population growth and a large population of children and young people? Use the Model to analyze these effects, and record your conclusions.***

Investigation: Extended Life Spans

"Affectionately named N/R_{40}-243, she achieved special distinction among the woodchip-lined cage of ordinary C3B10RF mice. While other mice were eating as much as they pleased and living to the ripe old age (for mice, at least) of 30 months, NR_{40}-243 was among those given 60 percent less Purina Lab Chow. The reduction extended her life to 54.6 months, making her possibly the oldest mouse ever known."

* * *

"But after demonstrating that many strains of animals live longer when they weigh less than nature dictates, researchers have yet to answer the big question: Does it work in primates?"

Bell, Laura, **Lean Living**. *Science News*, Vol 134, p. 42. (1988)

"Putting rhesus monkeys on a low-calorie diet has altered their metabolism in a manner that appears to have slowed their rate of aging, reports a team of scientists. . .Rhesus monkeys resemble humans in a way their biological systems age and incur age-related disease. . ."

Research Notes...Aging. *Chronicles of Higher Education*, Dec. 5, 1990, p. A10

Additional studies have confirmed and expanded these findings, and studies in humans have begun. Restricting the quantity of food seems to extend life in animals, but the food must be of high quality, with a full range of nutrients.

1: ***Compute the average life expectancy of humans if the effect of a reduced human diet were approximately the same as for the experimental mouse RN_{40}-243.***

2: ***Given this change in life expectancy, generate hypotheses for eventual, important, possible consequences for your society in each major category: people/demography, Setting, Action Patterns, and Shared Ideas***.

Investigation: Local or Regional Demographics

1: ***Obtain population data for your state, region, city or local area and graph it as a population pyramid.***

2: ***Identify as many consequences as you can of the population configuration as shown on your population pyramid—activities of various age groups, places used for those activities, sights, sounds, routines, patterns—every possible implication or consequence of the age distribution you can think of. (Record your results.)***

3: ***Draw a second population pyramid for your selected area representing how it might look ten years from now.***

4: ***Speculate about changes to your findings from step 2, and possible problems, as a consequence of the changes in age distribution of the population.***

Branching Out: Sub-Society Demographics

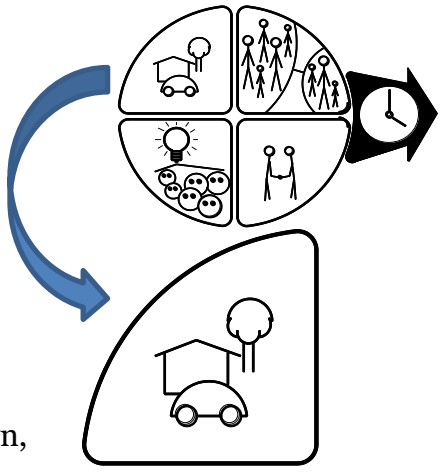
The final investigation in Part 3 looked at sub-societies in your area or region. If your investigation identified standard population categories that are part of census records, such as ethnic or racial identify, you'll be able to expand your data from that investigation to include Demographics.

Identify demographic statistics for an ethnic or other sub-society identified in public records, graph the statistics, and compare your results with the results for the general population collected in "Investigation: Local or Regional Demographics" above. Report differences in rates of population change, and reasons for the changes (e.g. birth rate, immigration).

Investigation: Target Area Demographic Change

Identify demographic changes within your target area over the past few years. Has the total population changed? Age distribution? Anything else? Record your findings.

Model Category: Setting



In Part 2, we said that one part of our Model is Setting, which includes not only a society's natural but also its human-made environment—tools, clothes, foods, roads and buildings—everything tangible. Note that the Setting sub-categories "natural" and "human-made" overlap. Human-made facilities and tools require natural materials and resources, and many parts of Setting are combinations of the two.

Setting—primary habitat (natural environment) includes:

- Climate: This affects the kind of crops that can be grown, the kind of buildings built, and much more.
- Resources: Oil, coal, metal ore, water, soil, and all other useful things that come from the earth and the sea
- Land: Space for cities, towns, farms, and forests
- Oceans, rivers and lakes
- Naturally-occurring plants, animals, and microbes. These may be beneficial or harmful.

The secondary (human-made) Setting includes:

- Towns, cities, and buildings
- Food production facilities: farms, ranches, aquaculture, commercial fishing, food processing
- Transportation facilities such as streets, highways, railroads, etc.
- Communication facilities and networks, both two-way (like the telephone) and one-way (like TV and newspapers)
- Tools used for working, entertaining, and solving problems
- Provision for waste disposal
- Sources of energy, and ways of getting it where it's needed.
- Significant peoples outside the group being investigated
- Everything else human made: symbols, art, etc.

Changes in Setting are important causes of major changes in a society's culture. You probably already know that many of the differences between your life and that of your great-grandparents at your age are because of changes in Setting, particularly those related to technology.

Technology as a Part of Setting

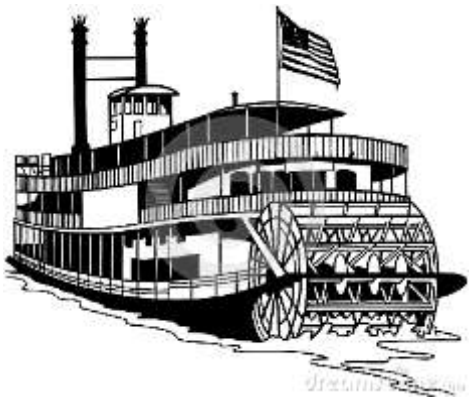
Part of every society is its tools. They usually determine who does what, with whom, how. A new tool can change a society's whole way of life.

There are thousands of examples. The Spanish brought horses to America, and some Native American tribes such as the Apache, Sioux and Comanche began using them, completely changing how they hunted and fought. The horses were a new tool.

In the American South, a little over 200 years ago, the cotton gin replaced slow, difficult separation of cotton fibers from seeds by hand. This reduced the cost of cotton for textiles, and the demand for cotton began expanding rapidly. This in turn led to the growth of large cotton plantations in the southern U.S., tended by slaves. The results are some of the uglier situations and events in United States history:

Year ►	1800	1831	1859
Bales of cotton produced	73,000	805,000	4,541,000
Estimated slave population	895,000	2,050,000	3,950,000
Estimated price of healthy field slave, New Orleans	$ 500	$ 950	$ 1,700

Besides the cotton gin, the growth and shaping of the United States in the 19th century was influenced by steamboats, railroads, canals, machine powered looms, and the reaper for harvesting grain. However, the effects of technology on society started long before that time, and will continue into our future.



Investigation: Stirrups and Medieval Society

Before the Middle Ages in Europe, armies of Greece and Rome mostly fought on foot. Some light cavalry (soldiers on horses) was used, and some "barbarian" horse-mounted troops fought effectively against Greek and Roman forces. However, cavalry troops became much more powerful after they adopted stirrups (which were probably invented in Asia). The change was so significant that it was one element bringing a new age to Europe.

Below, in random sequence, is a list of 14 changes that followed the invention of stirrups. Rearrange the list to show as many direct cause-effect relationships as you can. (Copying the 14 items on slips of paper may make them easier to shuffle and arrange.) Show the changes in a diagram.

- Horse saddles with stirrups
- Improvements in metallurgy and metal-working skills
- Armor for men and horses
- Increase in need for grain
- Increased social class and wealth differences
- Increase in cost of fighting
- Greater stability on horseback
- Help in donning armor, mounting, care of horses
- Need for bigger, stronger horses, and more of them
- More land under cultivation
- Taxation of farmers and peasants
- Bridge construction
- More effective use of lance and battle axe
- Advances in animal husbandry and breeding

Investigation: Historical Changes in Manufacturing

Not many generations ago, most goods and services were provided by individuals or very small groups. The butcher, the baker and the candlestick maker generally worked alone or with one or two others in a small shop.

Industrialization nearly eliminated this kind of work. The tools and techniques—part of Setting—changed radically, which changed the nature of the work itself, along with much, much else.

Charles Litchman was unemployed, formerly a shoe factory worker. In 1879 he appeared before a committee in Congress that was investigating economic problems. He explained the important differences between the old and the new ways of making shoes:[1]

Mr. Litchman: In my trade of shoemaking, 20 years ago the work was done almost entirely by hand. A man had to learn how to make an entire shoe. Now with the use of machines, a man is no longer a shoemaker, because there are 64 subdivisions in making shoes. A man may work 40 years at our trade and at the end of 40 years he will know no more about making a whole shoe than when he started.

The Chairman: He would only know how to make a peg or a waxed end?

Mr. Litchman: Yes; or he would be a laster, or a beveler, or heeler, or nailer, or he would be running and using a machine, or a peg-measure, or attending to any of the 64 subdivisions into which the trade is parceled out.

The Chairman: How many of the 48,000 Massachusetts shoemakers can make a shoe?

Mr. Litchman: I have no way to know, but I would guess that not one-tenth of them can make a shoe. The shoe that a few could make would be the old kind of turned shoe. I cannot make a machine shoe. My 64th part of making shoes is standing at the bench and cutting the uppers.

The Chairman: Still, because you once were a shoemaker, you might still hang out a sign, "Boots and shoes made"; but the man who only makes pegs cannot say to the world, "Here is a shoemaking shop," and go into business for himself.

(Continued)

[1] "Testimony of Charles H. Litchman," *Causes of the General Depression in Labor and Business*, Investigation by a Select Committee of the House of Representatives, 46th Congress, 2nd session, Misc. House Doc. No. 5, 1879.

Mr. Litchman: No, sir. Of course, the man who makes pegs would not be called a shoemaker anyhow.

The Chairman: Does this rule which you have applied to the manufacturing of shoes apply to all other branches of manufacturing industry?

Mr. Litchman: For the most part, yes. I have no hesitation in saying that. It applies to every trade, even stonecutting.

Use subcategories from the whole Model (see Page 19) to analyze effects on workers of the old and new ways of manufacturing shoes.

Note not merely the differences in work procedures, but the possible effects of the changes on (a) social classes, (b) parenting, (c) marital relationships, (d) other human relationships within the community, (e) feelings of self-worth, (f) uses of time, (g) population distribution—and anything else you can think of which, directly or indirectly, might relate to the changed methods of production.

Investigation: City Design and Behavior

The late urban expert and author Jane Jacobs wrote some important books about city environments and their effects on the Action Patterns of residents. The information below is from her first book, *The Death and Life of Great American Cities*.[1]

Consider, for example…the North End of Boston. This is an old, low-rent area merging into the heavy industry of the waterfront, and it is officially considered Boston's worst slum and civic shame. It embodies attributes which all enlightened people know are evil because so many wise men have said they are evil. Not only is the North End bumped right up against industry, but worse still it has all kinds of working places and commerce mingled in the greatest complexity with its residences. It has the highest concentration of dwelling units, on the land that is used for dwelling units, of any part of Boston, and indeed one of the highest concentrations to be found in any American City. It has little parkland. Children play in the streets. Instead of super-blocks, or even decently large blocks, it has very small blocks. In the words of planners, it is "badly cut up with wasteful streets." Its buildings are old. Everything is assumed to be wrong with the North End…

(Continued)

[1] Jane Jacobs, *The Death and Life of Great American Cities*, New York, Random House, 1961. Adapted from the Introduction.

Twenty years ago, when I first happened to see the North End, its buildings—town houses of different kinds and sizes converted to flats, and four- or five-story tenements built to house the flood of immigrants first from Ireland, then from Eastern Europe and finally from Sicily—were badly overcrowded, and the general effect was of a district taking a terrible physical beating and certainly desperately poor.

When I saw the North End again…I was amazed at the change. Dozens and dozens of buildings had been rehabilitated. Instead of mattresses against the windows there were Venetian blinds and glimpses of new paint. Many of the small, converted houses had only one or two families in them instead of the old, crowded three or four. Some of the families in the tenements (as I learned later, visiting inside) had uncrowded themselves by throwing two older apartments together, and had equipped these with bathrooms, new kitchens and the like… Mingled all among the buildings for living were an incredible number of splendid food stores, as well as such enterprises as upholstery making, metal working, carpentry, food processing. The streets were alive with children playing, people shopping, people strolling, people talking. Had it not been a cold January day, there would surely have been people sitting.

The general street atmosphere of buoyancy, friendliness and good health was so infectious that I began asking directions of people just for the fun of getting in on some talk. . .This struck me as the healthiest place in the city.

I could not imagine where the money had come from for the rehabilitation…To find out, I went into a restaurant and called a Boston planner I knew.

"Why in the world are you down in the North End?" he said. "Money? Why, no money or work has gone into the North End. Nothing's going on down there. Eventually, yes, but not yet. That's a slum!"

"It doesn't seem like a slum to me," I said.

"Why, that's the worst slum in the city. It has two hundred and seventy-five dwelling units to the net acre! I hate to admit we have anything like that in Boston, but it's a fact."

"Do you have any other figures on it?"

"Yes, funny thing. It has the lowest delinquency, disease and infant mortality rates in the city. It also has the lowest ratio of rent to income in the city. Boy, are those people getting bargains. Let's see . . . the child population is just about average for the city, on the nose. The death rate is low, 8.8 per thousand, against the average city rate of 11.2. . .Of course it's a terrible slum."

For contrast, here's another excerpt from Jacobs' book:

> Consider the Morningside Heights area in New York City... It enjoys a great abundance of parkland, campus, playground and other open spaces. It has plenty of grass. It occupies high and pleasant ground with magnificent river views. It is a famous educational center with splendid institutions—Columbia University, Union Theological Seminary, the Juilliard School of Music, and half a dozen others of eminent respectability. It has good hospitals and churches. It has no industries. Its streets are zoned against "incompatible uses" intruding into the preserves for solidly constructed, roomy, middle- and upper-class apartments.
>
> Yet by the early 1950's Morningside Heights was becoming a slum so swiftly, the surly kind of slum in which people fear to walk the streets, that the situation posed a crisis for the institutions. They and the planning arms of the city government got together, applied more planning theory, wiped out the most run-down part of the area and built in its stead a middle-income cooperative project complete with shopping center, and a public housing project, all interspersed with air, light, sunshine and landscaping. This was hailed as a great demonstration in city saving.
>
> After that, Morningside Heights went downhill even faster.

Clues to the differences between the two areas are in the descriptions. ***Imagine yourself in Boston's North End, and think about reasons why the delinquency rate might be low. Record your explanations in your journal.***

Then imagine yourself in Morningside Heights. Why might you be afraid to walk the streets? Record your explanations in your journal.

If possible, identify local areas that resemble one or both of these city environments. Take photos or make sketches to show the environments, and describe their possible effect on the people that use them.

(Investigation continues next page)

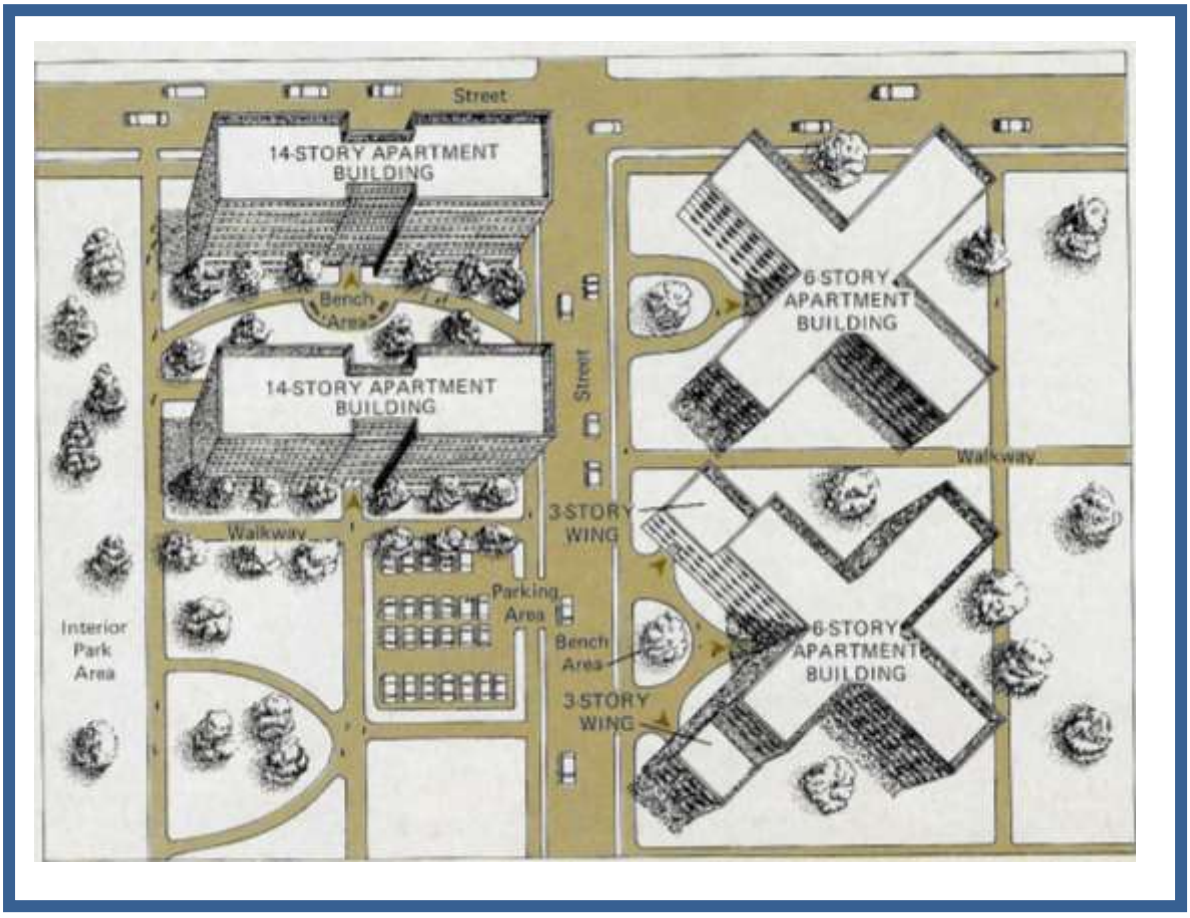
(Note that Jane Jacobs' criticisms of New York City's Morningside Heights area reflected a temporary situation, and this area is now a stable, healthy neighborhood. See: http://michaelminn.net/newyork/urban_renewal/upper_west_side/jane_jacobs/)

Architect and city planner Oscar Newman studied two apartment complexes in Brooklyn, New York in detail, and this is based on his work.[1]

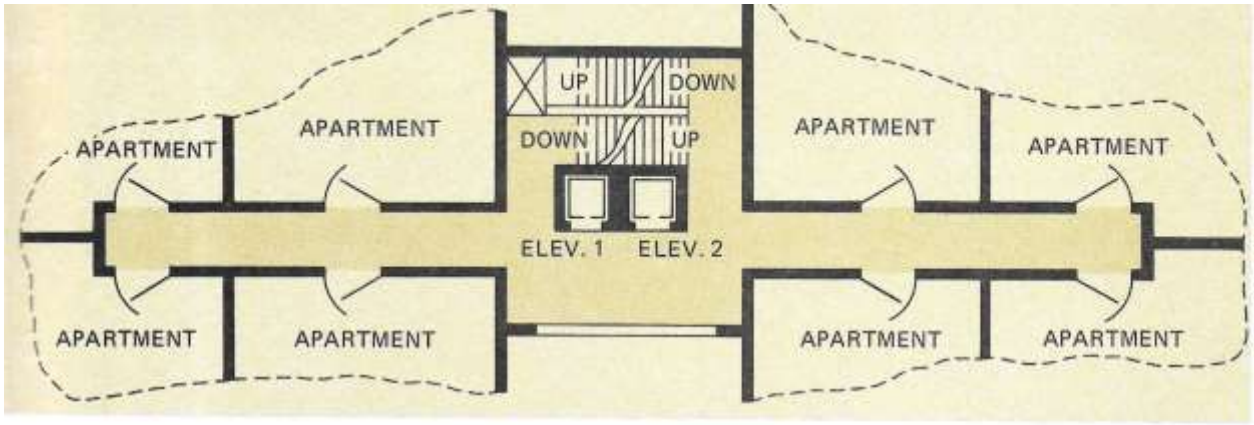
The complexes are alike in many ways. They're across the street from each other. One houses a little over 5,000 people; the other about 6,000. Both cover about the same number of acres. The floor space per person is about the same. Also about the same are the racial mix, family incomes, and the proportion of children to adults.

In spite of these similarities, one complex has many more problems than the other. The differences are almost certainly related to the differences in the Settings—interior and exterior designs.

Work with others to analyze and discuss the drawings of the Settings on this and the next page. Record, in your journal, answers to the questions on the next page. Important: For each answer, write a brief explanation.

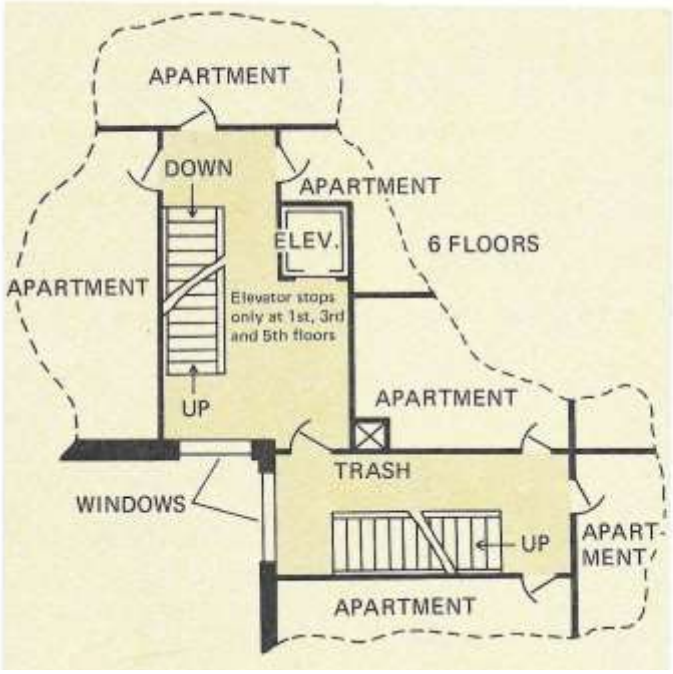


[1] Oscar Newman, *Defensible Space*, New York, Macmillian, 1972 (Adapted in Marion Brady and Howard Brady, *Idea and Action in World Cultures*, Englewood Cliffs, N.J., Prentice Hall, 1977, pp. 120-122.)



Above: hallway plan in 14-story apartment building. Note that stairs behind elevators are in a walled-off stairwell, with access doors at each level.

Right: Hallway plan in six story apartment building



Based on your analysis, decide which apartment complex:

- ***Has a greater problem with trash and garbage in hallways and around the buildings?***
- ***Has more residents acquainted with each other, at least casually?***
- ***Has more maintenance problems due to vandalism?***
- ***Has residents that feel more a part of a neighborhood?***
- ***Has an outdoor entrance that's safer for a person returning home at night?***
- ***Has hallways where some parents leave their doors open, and allow small children to ride tricycles?***
- ***Has more places where crimes can occur without anyone noticing?***
- ***Has the higher crime rate, in your opinion?***

Investigation: Modifying Your Setting

The investigation that follows is similar to many in this book. It calls attention to the real world and asks you to think about it in new ways.

1: ***Working with a few others, sketch a pencil map of your neighborhood. Show everything you think is important. You may want to make changes as the investigation proceeds—that's OK.***

2: ***In your journal, describe how your neighborhood might be affected if, in the future, energy costs were so high that most families couldn't afford to own a powered vehicle, or even make frequent use of public transportation. Identify problems and possible solutions.***

3: ***Redesign the neighborhood to make it more effective for a fuel-limited future. Explain the changes in your journal.***

Investigation: Literature

Choose a story or account written at a different time and/or place from the present (for example, a work of fiction written in 19th century America or England). As you read it, find and list clues that identify significant parts of the Setting and Demographics (e.g. population density) where the story or account takes place. List Action Patterns that differ from those usually followed in present-day America.

Which of these Action Patterns probably grew out of the environment (e.g. use of horses and horse-drawn vehicles)? Which ways of acting likely grew out of Shared Ideas that were different from those in present-day America? Identify the possible Shared Ideas that "explain" those differing ways of acting.

ON THE RAFT.

https://en.wikipedia.org/wiki/Jim_(Huckleberry_Finn)

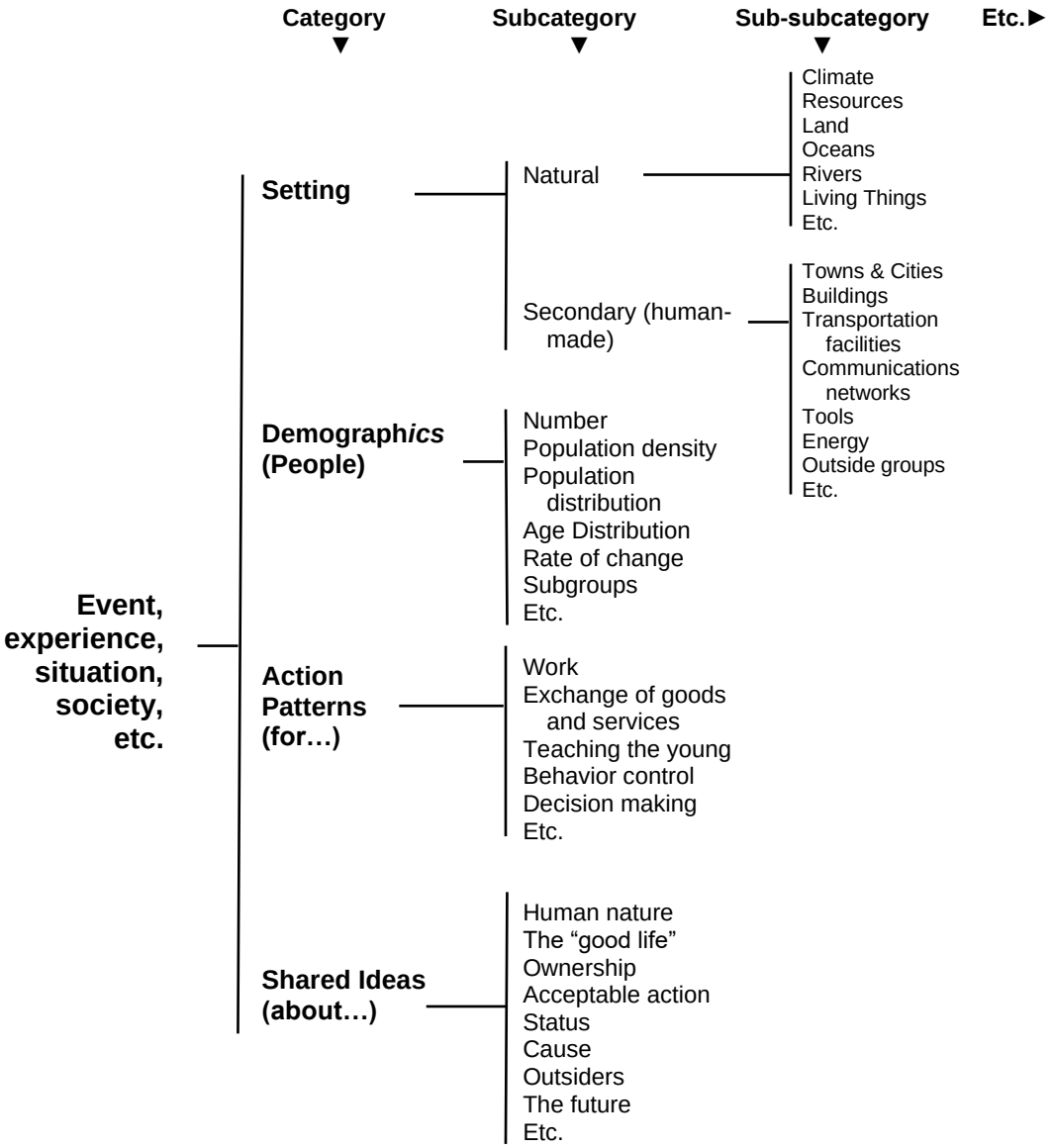
Investigation: Target Area Setting

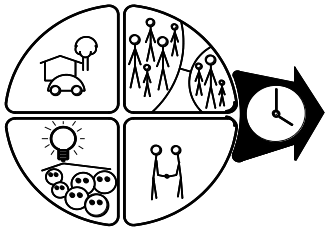
Understanding your Target Area more completely will require more data about its Setting. ***With your work group, choose one of the following, investigate and prepare a report on your findings.***

- Sunlight affects the building or buildings in your Target Area. Identify places where the sun's effect is greatest. Make measurements to find how the sun's angle is changing from day to day (e.g. length of the flagpole's shadow at the same time each day). Explain this change with diagrams. Measure the effects of the sun's heat and light on the building interior.
- Precipitation—rain, maybe snow—falls on your Target Area. How much? When? (Check local statistics.) Where, specifically, does the water go when it runs off? (Describe its route to the nearest river.) How contaminated is the water that comes off the building roof? Off the parking lot? What are the contaminants? Find out if they're harmful in some way.
- Your Target Area uses energy—electricity, and perhaps natural gas or other fuel. Find out how much is used, what it costs, how efficiently it's used, what the by-products are (e.g. carbon dioxide from burning fuel). Identify the source of electricity, and find out how it is produced.
- Identify the different kinds and amounts of waste produced in the Target Area. Where does it go? How is it processed? How much is recycled? Where will it be when you're 60 years old?
- Other possible investigations of Target Area Settings: foot and vehicle traffic studies, air quality, etc. Make sure that whatever you investigate has important effects on the main Target Area system.

A Detailed Version of the Model

(Note: Every subcategory and sub-subcategory may be divided further.)





Time & Systemic Relationships: In every situation, each category (and sub-category) is affected by many others. Changes across time can occur in every category, triggering other changes.

For Teacher/Mentor:

Any part of the Model is of most significance when it's changing. As noted earlier, societies are systems, so when one thing changes, other things change—for better or worse.

Investigation: Demographics/Population Change

A note about graphing: We're asking learners to extrapolate future population, and this cannot be done reasonably unless the time scale is linear—equal space on the graph representing an equal number of years. The statistics we've given aren't equally spaced in time, and this irregularity must be taken into account when marking points on the graph.

After Europe, Asia and North Africa recovered from the "black death" plague that decimated populations in the 14th century, world population grew steadily, as shown by the data for 1500 and beyond in this investigation.

In the western hemisphere, however, the arrival of Europeans brought along what might be called "white death"—mainly influenza, measles and smallpox—to which native populations had little resistance. These diseases apparently killed two thirds or more of the natives; hence the huge population decrease in North America over the next hundred years. Since that initial decrease in North America, the main population story almost everywhere has been growth.

Note that the numbers given for North American population in 1500 vary enormously between sources, and cannot be determined with any accuracy. Data in the learner materials is a low-end estimate. An estimate given at http://nativeamericannetroots.net/diary/325 is 18 million natives in what is now the United States and Canada at the time of first European contact.

(If learners using these materials are not living in North America, we suggest finding alternative data to graph for whatever continent or region is of prime importance.)

Evaluation of materials produced by learners, such as the graph required by this investigation, may be done by either teacher/mentor, or by other learners, checking for two main characteristics: *accuracy* and *clarity*. Evaluation by peers will probably make a greater impression on learner than that done by a teacher. However, kids can be cruel with their criticisms, so some careful guidance of the evaluation process is needed. Keeping the sources of the graphs anonymous may be possible and helpful, along with focusing on positive attributes rather than negative. Avoid giving grades as much as possible. They rarely help.

Investigation: Demographics/Population Pyramids

Population pyramids are, of course, a major tool in demographic analysis, and are a main focus of this unit. This investigation introduces them by having learners create one from the numerical data provided. More accurate data comes from the decennial census, of course.

For learners using these materials not in the U.S., we suggest using data and pyramids for the nation or region locally important. Comparing two pyramids for

the same region with data for two periods 40-50 years apart, helps learners see how changes in population growth rate ripple through the pyramids. In the U.S., the post-WWII "baby boom" bulge has been the most significant feature of the nation's pyramid, and that cohort is now moving into retirement, putting extra strain on Social Security and Medicare.

Additional discussion questions: ***How do pyramids for large populations differ near the top with regard to populations of men and women? Why ?*** (Women tend to live longer than men in most societies. Reasons for this are complex, and not always clear. See http://www.newsweek.com/2014/08/08/when-it-comes-long-life-there-no-gender-equality-262578.html.) Hypotheses by learners about this phenomenon may be interesting.

One of the fastest-growing sectors of the population in developed countries in terms of percentage is the number of individuals living past 100. Why? What may be effects? (Improved health care is almost certainly the reason for this. This group, largely dependent, also affects needs for facilities and services for the aged.)

Investigation: World Demographic Trends

Germany's big demographic problem is the aging of their workforce, with inadequate numbers of younger workers to replace those who will be retiring within the next few years. To maintain current production levels, Germany will need six million workers it doesn't currently have. A second problem is that with fewer people working, tax revenues will decline, at the same time that the growing elderly population will increase demand for pensions and healthcare. A good summary: http://www.telegraph.co.uk/finance/economics/11644660/Germany-dominance-over-as-demographic-crunch-worsens.html.

Germany's growing demographic problem is shared by several Eastern European nations, Russia, South Korea and Japan.

The on-and-off policy of open doors to immigrants apparently can't solve the problem: http://www.dw.com/en/immigration-not-going-to-stop-germanys-demographic-problem/a-18993548.

The growing population in Middle Eastern and African countries is, of course, a far different problem. Obviously, a growing population needs additional housing, schools, healthcare facilities, roads and other infrastructure. In many cases, particularly in Africa, nations simply lack adequate resources to deal with these issues.

Branching Out: Sub-Society Demographics

This optional activity applies Demographics to extend an investigation done in Part 3. If the sub-societies the learners focused on are informal, not recognized ethnic or racial groups that show up in census information, the learner's job will be more difficult—perhaps to the point where it isn't worth trying.

Investigation: Extended life spans

Investigation: Local or regional demographics

Investigation: Target Area Demographic Change

Refer learners to the sub-categories of Demographics on page 1, and have them work cooperatively to fill in all the demographic blanks. Some administrative support to supply data for previous years is probably needed here.

Setting

Defined broadly, the Model element "Setting" includes every tangible element within a society, both natural and human-made. The role of technology in triggering changes in ways of living is generally understood and acknowledged. Even the names we give ancient eras—stone age, bronze age, iron age—reflect this near-universal understanding of the impact of tools on life.

Of additional major importance, but less thought about, is the effect of other elements of the secondary habitat—buildings, roads, streets, towns and cities—on the culture of the people who live in that habitat. Often, the interplay between a society's way of life and its Setting is subtle but it's always important. As learners will see, the shape of an urban landscape affects the attitudes and actions of those living there, sometimes in surprising ways.

When they analyze societies, learners must see Setting as a system component interacting with, affecting and affected by demography, Action Patterns and Shared Ideas.

Investigation: Stirrups and the Rise of Feudalism

For a recent critical analysis of the possible relationships between stirrups and the rise of feudalism, see:

https://legacy.fordham.edu/halsall/med/sloan.asp

However, this article doesn't invalidate relationships between stirrups and a whole cascade of changes associated with armor, knights, and other societal changes in medieval times, as pointed up by the investigation.

One possible sequence is below. There's some ambiguity; "Help in donning armor…" could be inserted earlier, after "Armor for men and horses," for example. The point is not in having learners come up with this exact sequence, but for them to find logical links from one item to the next in their sequences.

- Horse saddles with stirrups
- Greater stability on horseback

- More effective use of lance and battle axe
- Armor for men and horses
- Improvements in metallurgy and metal-working skills
- Need for bigger, stronger horses, and more of them
- Advances in animal husbandry and breeding
- Help in donning armor, mounting, care of horses
- Increase in need for grain
- More land under cultivation
- Bridge construction
- Increase in cost of fighting
- Taxation of farmers and peasants
- Increased social class and wealth differences

Scholars estimate that each knight going to battle for his lord required three horses and the support of 100 workers.

Investigation: Historical Changes in Manufacturing

The whole Industrial Revolution is summarized in this brief testimony. Perceptive learners can infer many of its effects, such as urban growth around factories. The solitary village shoemaker is out of business, and the village loses population to the city. The trained craftsman, with pride in his product and status among his neighbors for his necessary skilled work, is replaced by a machine operator that was trained for, at most, a few days. The factory worker was separated from his family for the full working day (probably ten hours of work at the time Mr. Litchman testified, and perhaps even six days a week). If the economy slowed, people put off buying shoes, and the factory cut back on hours or laid off workers.

Investigation: City Design and Behavior

Jane Jacobs, in her paradigm-shifting book, *The Death and Life of Great American Cities,* noted that city planners generally assumed that functional segregation was desirable, that stores and businesses should be separated from residential districts, and both of these away from industry. Where land was scarce, urban residential areas should feature high-rise buildings, attractively surrounded by park-like green spaces.

City residents instinctively prefer urban Settings that intermingle housing, businesses, shops, restaurants, neighborhood taverns “where everybody knows your name,” and even light manufacturing. Sidewalks alive with foot traffic all day and into the night are enjoyable and safe. Low-rise residences close to the street lead to informal surveillance of street life by many eyes, reducing the likelihood of crime. Having some jobs within walking or bicycling distance saves fuel and parking space, and lowers motor vehicle traffic.

Before Jacobs' book, these kinds of neighborhoods typically were accidental, created by unplanned growth. (European towns and cities are full of neighborhoods with charming diversity like this.) Now, because of the influence of Jacobs and others who reinforced her findings, mixed-use neighborhoods of this type are sometimes deliberately designed.

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Additional insight comes from investigation of two Brooklyn apartment complexes across the street from each other, based on the groundbreaking work of architect and city planner Oscar Newman. Crime was much higher in the newer high-rise (14-story) apartment complex.

After a bit of discussion, learners should have no difficulty choosing correct answers to the questions on page 16. The "meat" here is the learner's explanation that accompanies each question. Unlike most activities, there ARE wrong answers to the questions, but learners picking wrong answers (if they have suitable explanations) should not be penalized.

In this investigation, learners are, of course, looking for relationships between Model parts "setting" and "patterns of action." Conclude the activity by having them identify the important action patterns (possible deviant patterns and contrasting patterns that reduce or prevent deviance), and the significant and related elements of setting (observation of places where deviance might occur, for example.)

Newman's work has made a difference. https://www.huduser.gov/publications/pdf/def.pdf is a HUD document in which Newman explains the history that led to his investigations, the principles of defensible space, and his conclusion (among others) that public spaces can be problems unless the residents "take ownership" of them. This is a function of careful design.

Note: Crime in the United States peaked sharply about 1990, and has, for the most part, declined ever since, at first steeply, then less so. In 1990, New York City had 2,245 murders; in 2014, the number of murders dropped to 328. Other kinds of crime declined as well, just about everywhere in the U.S. (Some evidence shows the decline in crime has leveled off, and even may be rising a bit again.)

Crime is a complicated subject, so complicated we really don't know why the rate varies. Interestingly, most developed nations have lower crime rates than the U.S.—some far lower.

One complication often not considered is the way that perceptions of police competency can affect crime rates. Crime rates are, of course based only on reported crimes. Some crimes are never reported, particularly if the victim sees reporting the crime as futile. In some actual situations, improving the quality of police work reduced the actual amount of crime, but *raised* the crime rate because people were more willing to report criminal activity.

Investigation: Modifying Your Setting

A fuel-limited future seemed more likely a few years ago, before the growth of renewable electric energy, electric vehicles, and other energy reducing actions.

However, when energy resources are non-renewable, as is the case with oil, there's obviously an eventual limit to its availability. Learners considering changes to reduce fuel use will likely be innovative—with ideas such as mobile neighborhood markets and services that would serve most people by walking or bicycling. It takes less fuel to move one food-market truck into a neighborhood rather than everyone going to market in a car or even on public transportation. Some might propose the return of horse-drawn vehicles, backyard or neighborhood vegetable gardens, chicken coops, and so on.

Investigation: Literature

As noted earlier, cooperating with a language arts teacher could yield many benefits. The Model used in *IS* allows learners to apply its insights and organizing scheme across the entire realm of knowledge. Opportunities for using stories or passages from one's own and other, contrasting societies are almost endless. Using the Model categories for describing and analyzing—Setting, Demographics, Action Patterns, Shared Ideas—adds a measure of active learning to language arts.

Similar analytical exercises may be used with any available literature and other documents, art, or artifacts from *any* source in *any* historical period. Making sense of the creative products of members of a society requires an understanding of the culture of that society. Analysis using the Model categories developed in *CIR* provides "windows" into that culture. There are, of course, universal elements in art and literature that touch people across societal boundaries, but appreciation of any product of human creation is enhanced by an understanding of its cultural context.

Investigation: Target Area Setting

Ideally, each work group will choose (or be assigned) different investigations of Setting from this "right here, right now" activity. Reports can then be made to the entire class, increasing their understanding of the Target Area. As always, the products produced by the investigations should be designed for effective communications—clear writing, accompanied with illustrations, tables, photographs, and whatever else is needed to enable effective information transfer to others.

As with similar activities done earlier, these Target Area Setting investigations have a strong science element, creating myriad team-teaching possibilities similar to those with a language arts specialist.

For learners with a botanical inclination, this might be added:

> **Target area flora:** What plants grow in the target area, including weeds and other "unintentional" plant life? (An inventory should be as complete as possible, documented with photographs or drawings. If possible, learners should identify a common or scientific name for each plant.) Which plants are similar? In what way are they similar? Does the similarity indicate a relationship (say, exposure to particular amounts of

sunlight or moisture)? Identify possible systemic relationships between plant location and the number and type of plants, and the rate of plant growth.

We'd like to break down the borders between school subjects. The world we seek to understand and explain isn't very well served by the traditional core curriculum. We'd also like to see middle and high schools consider teaming two or more teachers and assigning them the same kids from the time they enter until they leave—a source of stability and sense of community in an increasingly fragmented society. ##