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"It is a well-known scandal that our whole educational system is geared more to categorizing and analyzing patches of knowledge than to threading them together."
– Harlan Cleveland, Change, July/August 1985, p. 20.
Big ideas that shaped *Investigating Systems*:

- The future will be more complicated than the present. Old solutions won’t solve new problems.
- To solve problems, you need to make sense of the real world.
- In the real world, everything connects. You’ll need to understand “systems.”
- Because they’re the creators of all sciences and all arts, human societies are the most important systems you can study.
- Making sense of systems requires organized thought. School subjects aren’t very good organizers.
- Thinking about ways to organize thought improves how you do it.
- For sense-making purposes, the real, everyday world is a better “textbook” than textbooks about it.
- Everything you learn should be useful, right here, right now.
- Writing makes you think. (Keep a journal.)
- Dialog makes you think. (Work with others.)
- We’re not going to tell you much. We’re just going to give you a series of things to do and let you teach yourself how to make more sense of systems.

Marion Brady

Howard Brady
Investigation: What’s Going On Here?

At this very moment (like every other waking moment of your life), you’re "making sense" of what’s true right here, right now. You’re doing it pretty much automatically, using information flooding into your brain from your senses.

We’d like for you to switch your brain off its “automatic setting” and think consciously about that flood of information. (You’ll be more productive if you work with two or three others.)

Step 1  Make a list of what’s true for the room or space you’re in. To make the job easier, use short phrases or abbreviations. Quit when you have about fifty.

Your list might look something like this:

- lights on
- traffic noises
- Annie talking
- tile floor
- thinking about Saturday
- shuffling feet
- blue blouse
- Juan absent
- four windows
  (etc.)

Step 2  Discuss with others:

- If we hadn’t said “stop at fifty,” how many facts (the “raw material” for sense-making) could you have identified just for “right here, right now?”
- How long would your list of facts be if, instead of "right here, right now," you were listing facts for, say, the North American continent since 1492?
- How, then, do historians decide what to write about?
NOTE: Once in a while we’ll ask you to look back at something you’ve thought about earlier. For this reason, you’ll find it useful to keep a record of your thinking—a journal. We suggest a loose-leaf notebook, and some sort of system to help you keep track of where you are as we move along, such as repeating in your notebook the titles of the section or Investigation.

Investigation: Categorizing Information

For any period of time—a moment or a millennium—and any place—the space you’re in or a continent—the number of facts and the questions that could be asked about them are mind-boggling. “Making sense” is more complicated than it appears.

How do humans do it? How do you do it? How do you make sense of such a seemingly overwhelming mass of information?

You can take a first small step toward answers right now:

Step 1  Look at the list of “facts” you’ve gathered. Discuss:
- Which are most important? Least important? Why?
- Are any of the facts related? How?

Step 2  Write your thoughts about these questions in your journal.

Step 3  Working with others, sort and group the items on your list, putting what seem to be similar things together into categories. Focus on the information rather than on the sense (sight, hearing, etc.) you used to acquire it. Give each category a one- or two-word title, and put the titles in your journal.

(It might help to visualize a filing cabinet, with a drawer for each kind of information. For this mental filing system to work well, everything you know, everything you’ll ever know, should fit logically into one of the cabinet’s drawers.)
Investigating Patterns

Long before you started school, you learned to talk using complex sentences. How is it that you were able to do that? Not because someone had deliberately set out to teach you, but because you’d discovered the sentence-making formulas for your native language—the “master patterns” for putting together words to make sentences. You were then able to use these patterns to build absolutely original sentences by the thousands.

It’s the **discovery of patterns** that gives us understanding and makes it possible for us to function in human society. Pattern awareness tells us what to do—how to act at a crowded drinking fountain, which spoon to pick up at a formal dinner, what to do when entering a classroom, and where to point a telescope to see a particular star at a particular time. As the days and years pass, we discover, one by one, thousands of such patterns—patterns of personality traits, patterns of wave action, patterns of historical change, patterns of growth.

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Investigation: Social Patterns

Bedouins are nomadic, desert-dwelling Arabs in the Middle East. Their numbers are decreasing, but a few still follow tradition and live in camps. Following is a description of a stranger’s arrival at an encampment.

Step 1 Almost everything described below is a pattern. Read the account carefully and list (in your journal) the three or more patterns you consider most important.

In the Bedouin camp, one of the children saw a stranger approaching on a camel. The men and children stood in front of the tents to watch him arrive. The women and older girls hurried away into the women’s section.

All of them saw that the stranger was a Bedouin by his clothing. He wore a red checkered headcloth held by a rope around it, a long white shirt, and a dark brown cloak. Also, they knew that he must be an eastern Arab by the way he rode sitting high on the center of the camel’s hump and not back over the rump as southerners do.

The stranger approached slowly from the open side of the tents, which among the Mutair always faces south. He did not approach in a straight line, but in a zig-zag fashion, first showing one side, then the other, coming closer all the time.

When he was within calling distance, he was greeted:

“The peace be upon you.”
“And upon you the peace.”
“God willing you did not get tired.”
“It was not in vain.” (meaning “I may be tired, but it was worth it now that I can enjoy your company.”)

“Please come and rest. Make yourself at home.”
“May God be praised.”
“What is the news?”
“The news, by God’s will, is good.”

(Continued)
The greetings continued for some time, even after the stranger sat down with the men. Meanwhile, the boys got the coffee-making process underway. This was a small camp, and all the men were already assembled by the time the stranger dismounted. If the men had been scattered, the pounding of the coffee beans in a brass mortar (making it ring loudly) would have announced to all that a special occasion was being celebrated.

The coffee was served in tiny cups offered and accepted with the right hand. The guest was served first, followed by all the others. At these ceremonies, at least three rounds of coffee are always served. After three or more rounds, the guest will wiggle his empty cup to indicate that he wishes no more.

Step 2 In your journal, explain why the patterns you’ve chosen are important.

Step 3 Find a location where people frequently meet and greet, and you can overhear their exchanges. Observe, noting how greetings begin, how much talking each person does, their body language, tones of voice, how long the greeting takes, and how greetings end.

Step 4 Write a description of greeting patterns you observe. Make sure your descriptions are very detailed, similar to the description of Bedouin greetings above.

Step 5 How do patterns differ (a) between strangers becoming acquainted, and (b) between friends? Describe how greeting patterns between two friends are affected by the amount of time since they last met.

Leaves are chemical factories for plants. They vary a great deal in overall appearance, yet share similarities—patterns. There are many pattern puzzles in leaves. You could spend the rest of your life studying them and still learn new things.

**Step 1**  Select a part of your local environment large enough to contain a wide variety of leaves—at least 15. Include grasses, weeds, bushes, and trees. As you collect, note the kind of plant and important features of its environment.

**Step 2**  Tape leaves to sheets of paper by one point only (so you can see both sides), number each sample, and describe the plant and its environment.

**Step 3**  Describe patterns, noting in your journal similarities and differences in shape, color, vein configuration, top and bottom surfaces, etc. If you have a microscope, expand your observations. Use sketches and diagrams to clarify your descriptions.

Work on this activity until you learn things you never knew about leaves.

Which patterns seem to be most prevalent? In what kinds of environments are the plants with various patterns found?
Investigation: Mathematical Patterns

There’s a different pattern in each row of the table below. **Copy the table in your journal and fill in the missing numbers.** (The lower part of the table is more difficult. Find as many of the patterns as you can.)

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Investigation: Literary Patterns

Poetry is often more effective and easier to remember than prose because it has more patterns. “Sonnet,” “Iambic Pentameter,” and “Haiku” are words describing poem patterns.

**Find three short, very different poems, copy them in your journal, and identify as many patterns as possible.**
Investigation: Target Area

Making sense of “right here, right now”—your immediate experience—will be your most important task for the rest of your life. That task is hard, for a strange reason: it’s so familiar you tend to ignore it. This is what is meant by the old saying, “a fish would be the last to discover water.”

To help you with this, we want you to focus on a “Target Area” for continuing investigation for the rest of this course of study.

If you’re in a school, use it and the property it sits on. This will be your “laboratory.”

If you’re not part of a regular school, select a familiar territory—your place of worship, a large local store, or your immediate neighborhood. (Make sure your area has 50 or more people in it at least some of the time, to make it complex enough to be interesting.)

**Step 1** Begin a list of major features within the Target Area’s boundaries, You already know that listing everything is impossible, but you should be able to identify many important categories of things—organisms, structures, materials, resources, tools, etc.
Step 2  Precision requires numbers and measurement to answer questions such as, how much? how many? how far? how big? where, exactly? Begin your investigation by collecting precise data. For example:

- What’s the shape of the property? How long is each side? What’s the area?
- Where are the building(s)? What’s their shape and size? How much of the total area do they occupy?
- How many people are usually in the various spaces at various times?
- Males? Females?
- How many groups?
- How big is each group?

Step 3  The questions in 1 and 2 are only a start; you’ll need to ask and answer many more to get a really accurate picture of immediate reality. To record this information, make drawings, graphs, lists, tables, etc. (This will take a considerable amount of time.) Make this record about your target area easy to find later on. You’ll be adding to it, using information from other investigations.

Investigation: Patterns in the Target Area

Within the boundaries of the Target Area, there are thousands, maybe hundreds of thousands of patterns—patterns in the structure and organization of buildings, patterns in local weather, in plant and animal life, in the ways people act, in the use of time, and so on. Some are trivial, many are important.

Step 1  Identify and list as many patterns as you can.

Step 2  From the patterns you’ve listed, choose two that you think are important, describe them in detail, and tell why they’re important.
Branching Out

List some patterns for (a) interpersonal communication, (b) automobile traffic, (c) wind, (d) the behavior of a close friend.

If you’re working with others on this, compare your lists.

Branching Out

Music: Pattern is essential in all music. It’s the difference between music and noise.

Obtain a copy of printed music, and identify the patterns. Listen to a recorded song several times and do the same thing.
Investigating Relationships

As you’ve seen, making sense of the real world (knowledge) grows as pattern awareness expands. There’s a second major source of insight into the world around you—the discovery of relationships. [Note: When you hear or read the word “relationships,” you may think immediately of “human relationships.” That isn’t what we’re talking about. We’ll be concerned here with logical and cause-effect relationships. For example:

- Sunlight and plant growth are related.
- Lung cancer and smoking are related.
- Wet pavement and skidding are related.
- Economic hard times and political uncertainty are related.
- Tides relate to the moon.
- Weather relates to ocean currents.
- Suburban patterns for neighboring relate to street width.
- Rate of plant growth relates to soil characteristics.
- The welfare of a nation relates to its decisions about what to do with surplus wealth.

For individual humans, for whole societies and civilizations, in every field of study, a search for insight is, more than anything else, a search for possible and probable relationships.
Investigation: A First Look at Relationships

**Step 1**  
*Below are parts of relationship statements. In your journal, fill in the blanks with what seem to you to be useful hypotheses:*

___________________ is related to birth order.

Teen-age suicide is related to ____________________.

Claustrophobia can be caused by ____________________.

________is related to humidity.

Political stability is related to ____________________.

Violent behavior is related to ____________________.

____________________ is affected by color.

If job stress is high, then ____________________.

**Step 2**  
*Do you feel safer in some places than others? Explain how personal feelings of security and comfort (or insecurity and discomfort) might relate to each of these:*

(a) Neighborhood design

(b) Infant care procedures

(c) How classrooms are organized

(d) How schools are organized
Investigation: Aerodynamic Relationships

Investigate the relationship between the shape of a piece of paper and the speed with which it falls through the air. Using a sheet no larger than 8-1/2 by 11 inches, find ways of folding and/or cutting it that slow its fall as much as possible. Identify possible reasons for differences in speed between various shapes.

Investigation: Geographic Relationships

Step 1 Identify and list what you believe are the ten or 12 most important cities on earth.

Step 2 Check the geography where each of the cities is located, and identify similarities (patterns) in their locations. List the geographic characteristics probably related to city formation and growth.

Step 3 Find other locations with similar geographic conditions to those where important cities are located, except that important cities are NOT located there. Identify possible reasons why.
Investigation: Relationships in Public Issues

Below is a list of the states in the United States and their 2003 crime rates,* expressed as total crimes per 100,000 people. The list is arranged in series, with North Dakota having the lowest rate.

On a map of the United States, identify the locations of the 10 lowest crime states, and the locations of the 10 highest-crime states. Why do you think the crime rates differ?

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<th>State</th>
<th>Rate</th>
<th>State</th>
<th>Rate</th>
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</thead>
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Note: The causes of crime are complex, and some crimes are never reported, so don’t show up in statistics. Crimes totaled in the table are murder, forcible rape, robbery, aggravated assault, burglary, larceny/theft, and motor vehicle theft.

*FBI, Uniform Crime Reports, 2003
Investigation: Physiological Relationships

Step 1 Measure your heartbeat rate while you’re resting and haven’t exercised. Then climb stairs rapidly two or three times and check your heartbeat rate again. Record your results.

Step 2 As many times as possible for a week, climb up and down stairs until you’re tired.

Step 3 At the end of the week, repeat the measurement of heartbeat rate before and after climbing stairs. Are the results different from your earlier measurements? If they are, what might account for the differences?

Investigation: Relationships in the Target Area

The investigation you began on page 9 and continued on 10 is the beginning point for this investigation. Using that information, think about some possible relationships between parts of the Target Area you’ve identified (or will identify). For example, is there a relationship between the orientation of different parts of a building and use of electricity? Between sound levels and locations? Is the level of dust in the air different in different parts of the Target Area? If so, why?

List at least five possible relationships between parts of your Target Area.

Branching Out

Superstitions are relationships that some people have come to believe are true, but can’t be proven.

Identify and list a few common superstitions, then speculate about how they might have originated.

Branching Out

Historians and logicians refer to a problem in thinking they call the post hoc, propter hoc fallacy. People assume that because B follows A, that B is caused by A. For example, a person might drink grape soda on the third day of a bad cold, start feeling better, and rapidly recover. A post hoc, propter hoc fallacy would be the assumption that the grape soda caused the recovery.

Identify other possible examples of the post hoc, propter hoc fallacy.
Analytical Categories

Early in this course, in the second investigation, you organized chaotic information by *grouping* similar facts into “categories.”

“Analysis” is another way of processing information into categories, a kind of opposite of “grouping.” You’ve been doing it since you were an infant.

For example, your early categorizing system might have put all four-legged animals together under a single heading called “doggie.” However, you quickly moved on to a many-part system. Dogs, cats, cows, elephants, horses, and other familiar animals began to be seen as different kinds of things and were given different labels. This revised category system then became even more complicated. Instead of talking about dogs, you began to sub-categorize them, referring to poodles, shepherds, terriers, and retrievers. Now that you’re older and know even more, you may have elaborated the system even further—poodles, for example, may have become “toy,” “standard,” and so on. Like this:

![Category Tree Diagram]

We’ll call diagrams like this “category trees.” They can be used to organize almost any kind of information. Here are examples of two simple trees. Each word in each tree is a category, and the tree shows important relationships between categories.
Investigation: Developing Analytical Categories

Step 1  Choose one of the following and devise a category tree to analyze and classify information about it. Work with others, if possible.

• Means of transport  • Recipes
• Clothes  • Games
• Holidays  • Music

Step 2  Check your work. The category words in each column should “explain” the words in the previous column. The words on the extreme right and the word with which you started should be related.

Step 3  If possible, compare your work with that of others, thinking about relative strengths and weaknesses.

Investigation: Insect Analysis

Most of you already know that insects have six legs. (Spiders aren’t insects; they have eight legs.)

Step 1  Collect several types of insects.

Step 2  Besides six legs, find as many other similarities between them as you can. If possible, use a magnifier or microscope.

Step 3  Based on the similarities, draw a picture of a “basic” (prototypical) insect. Label the parts. If you have trouble thinking of labels, use combinations of words like, "leg section 1, closest to body."

Step 4  Based on your analysis, make a category tree for the parts of an insect.
Investigation: Analytical Categories in Commerce

Analytical categories are important because they organize information and help us deal with complexity. If a store puts its products on shelves in random order, finding something you want would be almost impossible. Quite naturally, similar products are grouped together.

The same principle applies to information. Random facts are hard to remember, but if they’re organized into categories, remembering and using them is much easier.

**Step 1**

Make a tree for the way products are organized in a typical supermarket.

**Step 2**

Nothing is perfect. Make a short shopping list, then go to your local supermarket. If you have trouble finding an item, this may indicate a problem with categories.

**Step 3**

Most stores place certain products in ways that make you notice and buy things you otherwise might not buy. Identify parts of the supermarket’s product display structure that cause you to slow down and notice or otherwise pay special attention.

Investigation: Analytical Categories in the Target Area

The Target Area investigation you began earlier should have given you a great deal of “raw material” to consider. Focus on one aspect of the Target Area and identify parts, sub-parts, sub-sub-parts, etc. Show your results in a tree diagram.

Branching Out

The simplest kind of analysis organizes whatever is being discussed into two categories. This “two-valued” approach is often used in describing the personalities of people, using contrasting terms such as “uptight/laid back” or “extrovert/introvert.” Identify similar terms commonly used to describe people. What are advantages to this form of analysis? What problems might result?
A system is an assembly of related parts that interact in patterned ways. If one part of a system changes, other parts will change.

You're surrounded by countless systems:

- Big systems (the solar system, the economic system of the United States, a hurricane)
- Middle-sized systems (your local water system, your school library)
- Small systems (cell phone, a kid on a bicycle, a burning candle)
- Biological systems (an oak tree, your digestive system)
- Social systems (A school club, the Navaho tribe)
- Molecules form systems—and your life depends on them.

The whole universe is a system. So are atoms. Every science is a study of systems. Understanding how to make sense of them is essential to survival. You’ve already begun the process by improving your ability to find patterns and relationships.

Four systems:
Investigation: Building and Analyzing a System

Step 1 Design a simple system, collect materials, and build it.

Some possibilities:

- Catapult
- Rubber-band powered toy car or boat
- Windmill-powered hoist
- A device powered by a falling weight
- Water pump

...or something else that moves around, makes noise, or does some kind of work. The website http://www.arvindguptatoys.com/toys.html has lots of plans for “toys from trash,” dreamed up in India.
Categories for System Analysis

Five important things to find out when you investigate ANY system:

- Its **environment**
- Its **structure** (the components, and how they fit together)
- **Interaction** between components within the system, and between the system and its environment.
- **Forces** that make the system operate
- System **changes** as time passes.

**Step 2** After you get your system working, observe its operation carefully. Look at the definition of a system at the beginning of this part, and tell how your system fits the definition. Note that “relationships” and “patterns” are an important part of the definition.

**Step 3** In your journal, write a description that tells very precisely how and why the system works. Use pictures and diagrams if they help. Make sure you describe the system environment, structure, interaction, forces, and changes (see above).

(Clue: Think about the flow of energy into and through the system.)
Investigation: Looking at Other Systems

Choose one or more of the following systems, and use the “Categories for System Analysis” to describe each system and how it works:

- Flashlight
- Guitar or other musical instrument
- Kite
- Squirrel
- City water system
- Loaf of bread
- Mechanical clock

*Build category trees as part of your analysis.* The main parts of most systems are made up of sub-parts, and those sub-parts are made up of sub-sub-parts, and so on. Category trees will also help you show your analysis of environment, interactions, and forces.

We said, “Every science is a study of systems.” If you remember and use the principles of systems analysis, it will help you in every science course you’ll ever take, and help you understand much of the complex world surrounding you.

Investigation: Target Area Systems

**Step 1**  Your target area is certain to include systems. Identify and list as many as you can.

**Step 2**  Choose one of the systems and analyze it, using the standard categories (environment, interactions, etc.).
Investigation: Ecology

One possibly confusing thing about systems is “overlap.” If you go to the edge of the nearest pond and look for systems, you’ll find a huge variety. Each living thing—algae, plant, insect, tadpole, etc.—is a system, but each are components of larger systems.

Ecology is the study of these larger systems in nature, focusing on investigations like the following within a particular environment:

- Food and other requirements each kind of organism needs for life and growth
- Populations: How many of each type of organism are present? What controls and limits its population?
- Interrelationships: Predator/prey, food chains, oxygen and nitrogen cycles, etc.

Studying the ecology of even a small environment can be complex and require months or years to do thoroughly. However, beginning a study will suggest the systemic links that are everywhere. Work with others if possible.

**Step 1**  Choose a small, interesting and varied part of your local environment for investigation. Possibilities: A section of ditch, the edge of a pond or stream, an overgrown field or other area with a wide variety of organisms.

**Step 2**  Identify the significant non-living parts of the environment that affect living organisms. (Examples: soil, water…)

**Step 3**  Identify the most significant organisms (plants, insects, etc.), present within the area you’ve chosen. (If you don’t know the exact name of each organism, come as close as possible, and describe it with sketches or pictures.)

**Step 4**  Estimate the population of each organism within the area.

**Step 5**  Describe the ecology of your area, using the main categories for system analysis: (environment, structure, etc.) Identify as many interrelationships between elements of the environment as possible, and show these interrelationships in a diagram. (Think about questions such as: Which parts of your environment are food for other parts? Why do populations of various organisms differ?)
Systems With Human Components

You're a component—a working part—of many human systems, some large, some small, some extremely complicated, some less so. They have a great deal to do with how you think and act, and the better you understand them, the more likely it is that your life works out as you hope it will.

When you begin studying the most complex systems—those that have human components—your categories for system analysis must expand. The most important change is in the analysis of “motivating forces.” Energy and power are still important, but when humans are involved in a system, their ideas and ways of thinking are powerful forces, the most important things you can know about the system.

This: becomes this:

Motive force

Ideas

Note: We’ve said that ideas are the most important thing to understand in human systems, but ideas can’t be seen. Even if you ask people about their important ideas, they may not be able to tell you. You have to infer them by looking at ways of acting.

Investigation: A System Involving A Human

Step 1 A kid on a bicycle is a system involving one human. In your opinion, what are the most important things to know to understand that particular system? Make a list in your journal.

Focus intently, and discuss this with others. Make sure you read and think about what is at the top of this page. The task is more complicated than you might think, and will take time and careful thought.

Step 2 Organize your list using the main categories for system analysis.
Investigation: Systems With Several Humans

In all important systems that include humans, the system category “environment” must expand to include both the natural environment and the human-made environment—things like buildings, roads, equipment for transportation, communication, and tools.

This: becomes this:

Step 1  Observe and analyze a simple system involving a few humans working together, such as a neighborhood take-out pizza shop or similar small business serving the public. Look for patterns and relationships.

Step 2  In your journal, prepare a report, describing your “work group” system analysis. Include category trees and pictures or diagrams. Make sure your report identifies everything important that’s needed to make the system work, including important human-made parts of the work group’s environment.

Step 3  In every system, if something significant changes, other important changes will occur. Use your analysis to help you understand these processes:

- Devise a change you think will improve system functioning, and describe its probable effects.
- Sometimes a system can adapt to change and continue to operate. Identify a change in your “work group” that would trigger adaptive changes in other parts of the system, and describe them.
- Some changes may end a system’s ability to function. Identify one change of this type that might affect your “work group” system, and explain its probable effects.
Investigation: People/Demography

In human-based systems, the most important components are, of course, the humans. The analytical category “structure” must be expanded to include the characteristics of the people in the system—how many there are, their ages, and the male/female ratio, for example. (The study of population characteristics is called “demography.”) Within most human systems, people form sub-groups of various kinds, and they are also an important part of the system structure.

This: becomes this:

Structure       People/Demography

Step 1    Read the following account, then make a category tree for the people in each of the two main groups.

In 1541, Hernando De Soto and a group of Spanish soldiers he commanded became the first Europeans to see the Mississippi River. Here’s part of the account of that event, written by one of his men:*

For three days we tried to find some maize [Indian corn] to eat, with little success, and we were very hungry. The Governor [De Soto] decided we had to move to find food, even though the wounded men in our company needed rest. So we headed for the native town we’d heard about, called Quizquiz [probably in what is now western Tennessee—ed.]. We marched seven days through a wilderness, with many ponds and thick forests. We were able to cross all the waters we found by fording them on horseback, except some lakes that we swam across.

We arrived at the town of Quizquiz without being seen by the people who lived there, and we captured all the people before they could come out of their houses…

There was little maize in the place, so the Governor moved us to another town, a little over a mile from the great river [Mississippi]. There we found enough maize to fill our need. The Governor went to look at the river, and saw that near it grew many large trees suitable to make piraguas [boats], and a good place for us to camp. We moved, built huts, and settled on a plain a crossbow-shot from the river. We brought there all the maize from the towns we went through. The men began immediately to cut down trees and saw out planks to build barges.

(Continued)

* “The Narrative of the Expedition of Hernando de Soto by the Gentleman of Elvas,” Spanish Explorers in the Southern United States, 1528-1534 (New York, 1907) 201-4 (adapted)
Indians soon came from up the river, jumped on shore, and told the Governor that they were subjects of a Great Chief named Aquixo, who ruled over many towns and people on the other shore. The Indians announced that this Chief was coming the next day, with all his people, to hear what our Governor would command him.

The next day the Great Chief arrived, with two hundred canoes filled with armed men. These men were painted with red ore, and wore great bunches of white and colored feathers. They carried feathered shields in their hands, and they used these shields to guard the men who paddled the canoes. The warriors stood erect in the canoes from bow to stern, holding bows and arrows.

The barge that carried the Great Chief had an awning near the stern, where the Chief sat. Other less important Chiefs arrived in similar barges. The Great Chief gave orders from his seat to control the boats.

These boats all came down the river together, and arrived within a stone’s throw of where we were camped. The Governor was walking on the river bank with a group of his men, near where the boats stopped. The Great Chief said to the Governor, that he had come to visit, serve and obey him, for he had heard that the Governor was the greatest of the lords, the most powerful on all the earth. The Great Chief said he wished to find out what the Governor wanted him to do.

The Governor expressed his pleasure, and asked him to come ashore, that they might talk more easily. The Great Chief did not answer, but he ordered three barges to come to shore. A large quantity of fish was in the barges, along with loaves shaped like bricks, made of dried fruit pulp. Governor De Soto received these gifts, thanked the Great Chief, and again asked him to come ashore.

Giving the gifts was a test to see if our people could be caught off guard and harmed. However, the Governor and all our people were alert to danger, so the Great Chief had his boats move away from the shore. Our crossbowmen were ready, and with loud cries shot at the Indians, striking down five or six of them. The Indians left in good order, not one leaving his paddle, even if the person next to him had fallen. Shielding themselves, they left the area.

Afterwards they came many times and landed, but when we approached them, they went back to their boats. These were fine-looking men, very large and well formed. With their awnings, plumes and shields, pennants and the number of people in the fleet, they looked like a famous armada of warships.

During the thirty days that we stayed in this location, we built four piraguas. One morning, three hours before daybreak, the Governor ordered twelve cavalry [mounted fighters] to go, with their horses, into three of the boats. These were men that the Governor was confident could secure safe passage on the other side of the river, in spite of the Indians, or would die trying. He also sent some foot soldiers who were crossbowmen with them in the fourth piragua, along with oarsmen to row the boats, to

(Continued)
Step 2  Continue your system analysis of the two groups, creating descriptions or category trees for the environment, including human-made parts of the environment.

Investigation: Patterns of Action

The system analysis category of “interactions” also expands when you deal with human systems. The most important interactions in human systems occur between people. These are usually patterned—they occur over and over in about the same way.

As soon as they unloaded, the piraguas returned. Two hours after sunrise all the people had crossed over. The distance across the river was nearly half a league [over a mile]. A person looking across the river could not tell if a man standing on the opposite shore was a man or something else. The stream was swift, and very deep. The muddy water brought along from above many trees and much timber, driven onward by its force. There were many fish of several sorts, the greater part differing from those of the fresh water fish of Spain.

Step 1  Continue the previous investigation. Look again at the historical account, and list the actions taken by each of the two groups. Then group similar actions to form a category tree.

Step 2  Based on the actions, and other information in the statement, what ideas do members of each group share? Discuss, list and classify these ideas, then compare them with your own. (Actions that seem unusual or unfair to you will indicate idea differences.)
The Whole Model

You now have the main elements of a Model for investigating any kind of system, especially the systems that affect your life in important ways:

Because we’re dealing with systems, every part is related to every other part, and a change in any part will cause changes elsewhere. A change in demography, such as increased population, will likely cause changes in people’s patterns of action, such as their ways of schooling the young or distributing food. These, in turn, will cause changes in the environment and in ideas about others.

Investigation: Target Area Systems That Include Humans

**Step 1** Identify and list all the significant human sub-groups (part of people/demography) within your target area.

**Step 2** Describe each sub-group: Size, types of members, and relationship to other sub-groups and systems within the target area.

**Step 3** Using the whole system model (above) as a guide, identify shared ideas, patterns of action, and relationships to the environment for each sub-group.
Investigation: How Universal Is Our Human Systems Model?

**Judge rules for Asics**

BOSTON — A federal judge ordered Reebok and Ralph Lauren to stop selling their new Polo RLX Lite athletic shoe because its stripes resemble those on Asics’ popular running shoes.

U.S. District Judge Reginald Lindsay in Boston ruled that Asics was substantially likely to win its lawsuit against the other companies. The judge said he would shortly issue a preliminary injunction barring sale of RLX Lite shoes or anything else confusingly similar to an Asics shoe, pending the outcome at trial.

News reporters are reminded, over and over, that to tell any story, they must answer the five “W” questions:


Note that these questions “fit” logically with the main categories of our Model.

**Step 1**  Match each of the five “W” questions with its corresponding Model category.

**Step 2**  Test the Model by reviewing the “who, where, what, when and why” of human affairs in a news story, historical account, elderly person’s recollection, incident in your school, etc. In your journal, paste in news clippings or copies of other printed accounts, and write in other information from verbal accounts, then draw circles around the information that answers each of the “W” questions, and indicate which question is answered.

Note: The question “Why?” is sometimes not answered in news stories, either because the answer is obvious, or because the reporter doesn’t know the answer.

**Step 3**  For each story, identify possible systemic relationships between the components. For example, did the setting of the story (environment) have an effect on what happened?

**Step 4**  Another set of categories are often used to analyze a drama or play: Cast/actors, stage-setting, action, plot. Fit these categories to the model. How well do they match?
Part Three

Major Human Systems: Societies

Systems that have humans as components come in all sizes. Families are systems with only a few humans, but some systems can contain millions of people. The largest, most important of these are called “societies.”

People in a society share the same basic ideas and ways of acting. In a large society, these may vary somewhat between regions, but the most important ideas—the ideas that guide people when they make important decisions about their lives, or cause people to get angry when they’re violated—will be shared by almost all members of a society.

In the investigations that follow, you’ll look at some societies that probably differ significantly from your own. The differences will be clues to both the ideas and patterns of the other society, and the ideas and patterns in your own society.

Investigation: Traditional Korean Society

Important patterns of action are usually based on deep-seated beliefs and values. Consider the following:

Traditional Korean Funeral of an Elder

A low table with a bowl of uncooked rice on it is placed before the main gate of the house in which a death has occurred. It is to keep out the evil spirits which want to take the place of the soul in the body of the dead.

The body is placed in the coffin, which is placed on blocks in the main heated-floor room (an pang) of the house.

The sons and other relatives (up to second cousin) of the deceased greet the mourners and are expected to wail with an unrestrained show of grief, repeating five times a customary Korean exclamation for pain, “A-i-gu, a-i-gu, a-i-gu, a-i-gu, a-i-gu.” Others in the room respond with “O-i, o-i, o-i.”

(Continued)
Visitors first enter the room and bow deeply to the spirit of the soul that still remains with the corpse. Men make two deep kow-tows, each preceded by the circular movement of the joined hands known as the up.

The chief mourner may wear a wide wicker hat, like a shallow basket about two feet in diameter. This hat, worn mainly in summer, keeps most of the upper part of his face in shadow. It symbolizes the shame the son feels at allowing the parent to die, which makes him hide his face from heaven. He also carries a staff of paulownia wood if he is mourning for his mother, or of bamboo if for his father.

After bowing to the soul at the coffin, the mourners go outside and bow once more to the sons and other close relatives. They may say some words of sympathy. Then, they go to help with the meal or funeral preparations or to visit with other mourners.

A Child’s Burial

If a child dies, no funeral is held. The father simply puts the body in a straw bag, and possibly accompanied by one or two male relatives or other men, buries it in some isolated place with no ceremony.

I was interviewing a young Korean who was smoking. I noticed that he put out the cigarette whenever his grandfather entered the room. He relit it only when the old man left again.

Later I asked the same young man where a certain relative lived. The young man asked his grandfather. The old man replied that it was a certain village in a certain township. When I located the village on the map, I mentioned that it was in a different township than the old man had given.

The young Korean answered, “The map must be wrong. My grandfather knows about such things.”

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In your journal, make a graph similar to the one below, but larger:

![Graph](image)

On your graph, draw a line representing what appears to be Korean beliefs about the value of the individual.

*Draw a second line representing your own view of the individual’s value. You may feel it’s necessary to draw two lines—one for males, one for females.*

Summarize the traditional Korean action patterns and the shared idea you’ve identified. Then summarize the contrasting patterns and idea from your own society.
Investigation: Colonial Virginia Society

Sometimes we’re aware of differences in ways of seeing between others and ourselves because their actions are so different. As you’ve seen, Korean burial practices suggest that they believe that individuals have relatively little worth at birth, becoming more human and valuable as they live life. This belief contrasts sharply with the belief of most people in western society.

Below is an excerpt from the autobiography of Devereaux Jarratt, a minister in colonial Virginia. Find and list differences between his ideas and actions and those of your own society:

I was born in New Kent, a county in Virginia, about 25 miles below Richmond, on January 6\textsuperscript{th}, 1732.

My father was brought up to the trade of a carpenter, at which he worked until the very day before he died. He was a mild, polite man, and much respected among his neighbors. None of my ancestors, on either side, were either rich or great. My parents always had plenty of plain food and clothes, wholesome and good, suitable to their humble position and the times in which they lived. All of our food was the product of our little farm; our clothes were made by my mother, except our hats and shoes. We only wore our shoes in the winter season.

We made no use of tea or coffee for breakfast, or at any other time. I did not know a single family that used them. Meat, bread and milk were the foods which we ate. I suppose rich people made use of coffee and tea, but I had no way of finding out about the lives of the rich.

We always looked on what were called gentle folk as people of a different and higher kind. I was quite shy of them, and kept off at a humble distance. A periwig, in those days, was a symbol that the person was one of the gentle folk. When I saw a man riding the road near our house with a wig on, I would be alarmed and afraid. It would give me such a disagreeable feeling that I would run off and hide like my life was in danger. Such ideas of the difference between gentle and simple folk were held by everyone I knew near my own age.

\textit{In your opinion, would the ideas of the “gentlemen” who wore wigs have been more like those of Jarratt or more like your own society?}

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Investigation: Native American Societies

Below are excerpts from speeches and documents from members of various native American tribal groups. Study them. When you think you've identified an idea, belief or value that differs from one held by most people you know, write it down in your journal. (e.g. The Nez Perce believe that ________). Follow it with a statement summarizing beliefs of people you know.

Chief Joseph of the Nez Perce tribe:

“The earth was created by the assistance of the sun, and it should be left as it was. . . . The country was made without lines of demarcation, and it is no man's business to divide it. . . . I see the whites all over the country gaining wealth, and see their desire to give us lands which are worthless. . . . I never said the land was mine to do with as I chose. The one who has the right to dispose of it is the one who has created it.”

Walking Buffalo, a Stoney Indian, in about 1930:

“We saw the Great Spirit's work in almost everything: sun, moon, trees, wind, and mountains. Sometimes we approached him through these things. Was that so bad? I think we have a true belief in the supreme being, a stronger faith than that of most whites who have called us pagans. . . . Indians living close to nature and nature's ruler are not living in darkness.” “Did you know that trees talk? Well, they do. They talk to each other, and they'll talk to you if you listen. Trouble is, white people don't listen. They never learned to listen to the Indians so I don't suppose they'll listen to other voices in nature. But I have learned a lot from trees: sometimes about the weather, sometimes about animals, sometimes about the Great Spirit.”

A statement by Smohalla, a Sokulk, in about 1850:

“My young men shall never work. Men who work cannot dream; and wisdom comes to us in dreams.” “You ask me to plow the ground. Shall I take a knife and tear my mother's breast? Then when I die she will not take me to her bosom to rest.” “You ask me to dig for stone. Shall I dig under her skin for her bones? Then when I die I cannot enter her body to be born again.” “You ask me to cut grass and make hay and sell it and be rich like white men. But how dare I cut off my mother's hair?”

(Continued next page)
An old Wintu (northern California) holy woman:

“The white people never cared for land or deer or bear. When we Indians kill meat, we eat it all up. When we dig roots we make little holes. When we build houses, we make little holes. When we burn grass for grasshoppers, we don't ruin things. We shake down acorns and pinenuts. We don't chop down trees. We only use dead wood. But the White people plow up the ground, pull down the trees, kill everything. The tree says, ‘Don't. I am sore. Don't hurt me.’ But they chop it down and cut it up. The spirit of the land hates them. . . . How can the spirit of the earth like the White man? . . . Everywhere the White man has touched it, it is sore.”

Excerpt from the 1854 address by Chief Seattle of the Dwamish tribe upon giving up the land upon which the city of Seattle, Washington now stands:

“Your dead cease to love you and the land of their nativity as soon as they pass the portals of the tomb and wander away beyond the stars. They are soon forgotten and never return. Our dead never forget the beautiful world that gave them being. . . .”

“When the last Red Man shall have perished, and the memory of my tribe shall have become a myth among the white man, these shores will swarm with the invisible dead of my tribe, and when your children's children think themselves alone in the field, the store, the shop, or in the silence of the pathless woods, they will not be alone. . . . At night when the streets of your cities and villages are silent and you think them deserted, they will throng with the returning hosts that once filled them and still love this beautiful land.”
Investigation: Traditional Afghani Society

Below is a statement from a traditional man from Afghanistan. Identify an idea, belief or value that differs from one held by most people you know. Summarize both views in your journal.

“Everything I need to know to lead the good life and prepare for the life hereafter has been known for centuries. In his compassion for man, God has provided in the Koran a guide which is both complete and final. It does not make life hard for men, by telling them what they do not need to know or cannot understand. Neither does it omit the answers to any questions man might need to ask. All knowledge is to be revered, but the knowledge which has been given by God is infinitely more worthy than any knowledge man discovers, even as the Giver is infinitely more worthy than man.”

In your journal, explain how this traditional Afghani is likely to feel about:

- University professors and scientists
- Laws and courts set up by the government
- A natural disaster in Afghanistan, such as a drought.

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Investigation: Comparing Societies

Two very controversial questions almost always arise when societies are compared with each other. You may not feel you have enough information to begin answering the questions, but you can begin to think about them. *Jot down your ideas about the questions in your journal:*

**Question 1:** Do some societies have ideas and values that are superior to those of other societies? Explain and give reasons for your explanation.

**Question 2:** Do all societies share some “universal” ideas and values? If so, what are they? How do you know?

Investigation: Societies In The Target Area

In each of the preceding activities, you’ve contrasted your ideas and action patterns with those of members of other societies—Afghanis, Koreans, native Americans, etc.

If your Target Area (school, neighborhood, etc.) is typical, it includes people with a variety of family backgrounds, with parents or grandparents from other societies.

**Step 1** Identify as many people as possible in your Target Area whose parents or grandparents grew up in a society different from your own. List the societies which they represent.

**Step 2** Interview at least one person from a society unlike your own, and identify as many ideas and beliefs as you can that differ from yours. Be prepared with questions such as:

- What did you think was strange when you came here?
- What ideas or beliefs do you think were better where you came from?
- What ideas or beliefs do you think are better here than where you came from?
Investigation: Identifying Sub-Categories

In your analysis of societies so far, you’ve identified some ways of acting and some ideas that differ from your own. For example, you found that among traditional Koreans, people are thought to increase in value the older they get. Small children are of far less importance.

Although the ideas differ, every society on earth has ideas about the relative importance of different people. For example, some consider that importance—status—is inherited from parents. In those societies, if your parents had low status, you’ll have low status, and there’s not much you can do to change it. In other societies, status depends on wealth or skill or something else. Important ways of acting grow out of these status ideas. “Status” is a major sub-category of shared ideas for all societies.

Look back at the societies you’ve analyzed so far and identify other general sub-categories for each of the main Model categories. Develop trees for important sub-categories. Here’s a start:

This is a major task. Take your time. There’s lots of opportunities for model refinement, a process you should continue for the remainder of this course.

Every society must solve many of the same problems, such as maintaining order, caring for and educating the young, growing and distributing food, making decisions that affect many people, supplying means of transportation and communication. These universal problems are indications of major sub-categories.
Note 1  We said, “Identify and list important sub-categories . . .” So, how do you tell the “important” from the “not so important,” or the “not important at all”? If we can’t figure this out, the Model will grow to a size that’s totally unmanageable.

Use the “system test” to help you decide what to include. A component is more or less important depending on how much a change in it would trigger other changes. This is sometimes hard to figure out, but keep it in mind and try to apply it.

Note 2  There isn’t just one “correct” set of sub-categories for the categories we’ve identified. Many different approaches can be useful. The object is practicality—putting together a system that keeps us from overlooking some part of a society that might be important in understanding what’s going on, yet helps us be ever more precise in our descriptions and analyses of ourselves, each other, and the world around us.

****

Everything important about a society—every idea, every fact, every object, every person—in fact almost everything you know about or can think about, should fit logically into one of the sub-categories you’ve just identified. Have you an appropriate place for cotton gins? Family size? Dreams of wealth? Inheritance procedures? Mercury in the drinking water? Dating? Shoes? Irrigation? Prisons?

Investigation: Identifying Category Problems

We’ve established that, when we describe reality, we put the information into one of four categories (“time/change” makes five.):

- People/Demography
- Environment
- Patterns of Action
- Shared Ideas

Look back in your journal at the lists you made while building your Model for the study of societies. Identify, if possible, at least one entry from it that doesn’t seem to fit comfortably and logically into one of the Model categories.

One or more items on your list will “spill out” of one or another of the categories, or will fit in several categories equally well. For example,
“government” may have been on your list, and you can’t get it to fit neatly inside one of the four categories.

Does that mean there’s something wrong with our category system? No. The problem lies with the vagueness of some of the ideas we try to categorize. The concept “government” is such an idea. It’s a familiar word, and is in everybody’s vocabulary, but it isn’t a particularly useful concept. It’s just too general. We must break the it down, being as specific as possible, then classify the components.

*Use the four Model categories to sort the items in the box below:*

<table>
<thead>
<tr>
<th>Sending forms to IRS on April 15</th>
<th>Aircraft carrier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yosemite National Park</td>
<td>States can’t tax each other</td>
</tr>
<tr>
<td>“One person, one vote”</td>
<td>Naturalization</td>
</tr>
<tr>
<td>Immigrants, 1961-70: 3,338,000</td>
<td>FBI</td>
</tr>
</tbody>
</table>

The big idea “government,” if it’s broken down into its component parts, will fit into our category system. If, instead of vague terms such as “social,” or “economic,” you say *precisely* what you mean, you won’t have much trouble sorting it into a category—environment, people/demography, pattern of action or shared ideas.

*Do with “religion” and “education” what we’ve just done with the concept “government” (i.e. “take them apart” into their components, and sort the components by Model category).*
Investigation: Sub-Societies in Your Area

Step 1  Use the model you’ve been developing to analyze groups of people in your town, city or region. Identify those that qualify as sub-societies. (Think carefully here. Not all sub-societies will have formal or proper names. Sometimes they’ll simply be called “those people,” or “them,” (as in a mother’s comment, “I’d rather you didn’t hang around with them”).

As you attempted the above assignment, you were probably most aware of relatively superficial dissimilarities such as differences in:

- words, phrases or slang used frequently
- clothing types and brands worn
- favorite radio stations and types of music
- breeds of dogs preferred as pets
- makes and models of vehicles admired
- stores patronized
- clubs preferred
- sports engaged in
- foods eaten, and meal times
- occupations preferred
- television shows watched
- political and/or religious affiliation
- (and so on)

Step 2  Add to the list using examples from your own experience. Then, for each item that applies, identify specific local differences between the dominant society and the sub-society. (In the area where the authors live, one sub-society prefers tennis and SUVs, another prefers hunting and pickup trucks.)

Step 3  In your journal, draw a rough map of your town, city, or region, locate sub-societies within it, and estimate their degree or percentage of coincidence (overlap of ways of thinking and acting) with the dominant society.

Step 4  This may strike you as stereotyping. It isn’t. Why not? In your journal, explain why it isn’t. (Check the definition of “stereotype” for some help here.)

Step 5  As we pointed out, differences between the dominant society and the sub-society such as those above tend to be rather superficial. Speculate about more significant differences in local sub-societies.
Investigation: Extending the Model

Here’s a partial elaboration of the Model component “climate.”

*Keeping in mind that there is no one “right” tree, extend in similar fashion three or four other randomly-chosen categories from Level 3 out to Level 5 or 6.*

<table>
<thead>
<tr>
<th>Climate</th>
<th>Temperature</th>
<th>Humidity</th>
<th>Wind</th>
<th>Rain</th>
<th>Snow</th>
<th>Sunlight</th>
<th>Clouds</th>
<th>Annual Total</th>
<th>Frequency</th>
<th>Seasonal Variation</th>
<th>Maximum/Minimum</th>
<th>Daily Patterns</th>
</tr>
</thead>
</table>

Note: You may wish to compare your own expanded version of the Model and its sub-category trees with a version shown in the Appendix. It’s a summary of the work of many other students.

**Why Study Societies?**

If your interest is chemistry or music or some other field, our emphasis on the study of societies may be frustrating. Are societies that important? Absolutely! Everything you think and do, now and in the future, every emotion you experience, every problem you face, every success or failure you have, will be largely shaped by the society of which you are a part, and its intersection with other societies.

Nothing you learn could be more important.
Investigation: Locating Societies

Below are two maps of northern Africa. The first shows the approximate boundaries of ancient societies; the second shows boundaries as they were in about 1900, as imposed by European colonial powers. As you can see, they don’t look very much alike.

Some people confuse societies with nations. Occasionally, political and societal boundaries are the same, but most of the time, they’re different. In this activity, we won’t consider boundaries, but will instead look at general locations for societies with which you may be familiar.

*In your journal, sketch a simple outline map of North America. On this map, locate, mark and label the approximate geographic center of as many different societies (subcultures, ethnic groups) as you can identify. For now, stick with groups that are usually designated by proper nouns, such as “Amish” or “Navaho.”*
**Investigation: Demography/Population Change**

Demographic changes can affect how much you have to pay for a used car, 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 that are happening right now.

**Step 1** The table below estimates population of North America and the world at several points in the past.\(^1\) *Make a line graph showing the information.*

<table>
<thead>
<tr>
<th>Year</th>
<th>1650</th>
<th>1750</th>
<th>1850</th>
<th>1900</th>
<th>1950</th>
<th>1980</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>5</td>
<td>5</td>
<td>39</td>
<td>106</td>
<td>221</td>
<td>372</td>
<td>481</td>
</tr>
<tr>
<td>World</td>
<td>550</td>
<td>725</td>
<td>1,175</td>
<td>1,600</td>
<td>2,556</td>
<td>4,458</td>
<td>6,090</td>
</tr>
</tbody>
</table>

**Step 2** *Based on your graph, extrapolate (project out, based on trends) the population of North America and the world in 2020 and 2050.*

**Step 3** *Identify possible effects of the following on future world population:*

- The childbirth policies of the People’s Republic of China and other nations.
- The AIDS epidemic

---

\(^1\) *World Almanac and Book of Facts, 1996, p 838*
Investigation: Demographics/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 below shows the United States age distributions in 1970.²

²Source: U.S. Bureau of the Census. Refer to www.census.gov/population
Step 1  Below are data for population of the U.S. in 2000. Draw a population pyramid showing this data.

<table>
<thead>
<tr>
<th>Age</th>
<th>Male (000)</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>9,756</td>
<td>9,291</td>
</tr>
<tr>
<td>5-9</td>
<td>10,556</td>
<td>10,053</td>
</tr>
<tr>
<td>10-14</td>
<td>10,578</td>
<td>10,041</td>
</tr>
<tr>
<td>15-19</td>
<td>10,244</td>
<td>9,667</td>
</tr>
<tr>
<td>20-24</td>
<td>9,706</td>
<td>9,320</td>
</tr>
<tr>
<td>25-29</td>
<td>9,683</td>
<td>9,529</td>
</tr>
<tr>
<td>30-34</td>
<td>10,220</td>
<td>10,145</td>
</tr>
<tr>
<td>35-39</td>
<td>11,472</td>
<td>11,612</td>
</tr>
<tr>
<td>40-44</td>
<td>11,326</td>
<td>11,496</td>
</tr>
<tr>
<td>45-49</td>
<td>9,925</td>
<td>10,256</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Male (000)</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-54</td>
<td>8,501</td>
<td>8,897</td>
</tr>
<tr>
<td>55-59</td>
<td>6,455</td>
<td>6,928</td>
</tr>
<tr>
<td>60-64</td>
<td>5,115</td>
<td>5,673</td>
</tr>
<tr>
<td>65-69</td>
<td>4,415</td>
<td>5,154</td>
</tr>
<tr>
<td>70-74</td>
<td>3,940</td>
<td>4,992</td>
</tr>
<tr>
<td>75-79</td>
<td>3,008</td>
<td>4,377</td>
</tr>
<tr>
<td>80-84</td>
<td>1,815</td>
<td>3,116</td>
</tr>
<tr>
<td>85-89</td>
<td>866</td>
<td>1,894</td>
</tr>
<tr>
<td>90+</td>
<td>338</td>
<td>1,063</td>
</tr>
</tbody>
</table>

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

Step 3  World War II ended in 1945. After the war, the U.S. had what is usually called a “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 2000 pyramid? Mark your pyramid to show the baby boom.

Step 4  Identify and describe possible effects baby boomers had on American life as they passed through various ages. (For example, what kinds of problems might schools have had in the early 1950s?)

Investigation: Target Area Demographic Change

Identify demographic changes within your target area over the past few years. Has the total number of people changed? What about age distribution? Record your findings.
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?”


“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. . .”


---

**Step 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.*

**Step 2**

*Given this change in life expectancy, generate hypotheses for eventual, important, possible consequences for your society in each major category: people/demography, environment, patterns of action and shared ideas.*
Branching Out

1. Draw a population pyramid that includes the nearest 30 to 50 individuals within a circle having as its center your place of residence. (If you can’t be sure about the details, make an educated guess.)

2. Identify as many consequences as you can of the population configuration as shown on your population pyramid—activities, sights, sounds, routines, patterns—every possible implication or consequence of the age distribution you can think of.

3. Draw a second population pyramid for your neighborhood representing how it might look ten years from now.

4. Speculate about changes in (b) as a consequence of the changes in age distribution of the population.

Avoid:

- Irrelevant information.
- Focusing on the behavior of specific individuals rather than on general behavior related to age or sex factors.

Branching Out

Obtain population data for your state, region, city or local area. Graph it, and, using the categories in the Model, predict probable or possible effects on your local area.
Up until modern times most people lived in small villages or on farms. The environment most important to them was provided by nature. Fertile soil, good water, a source of fuel such as wood, and similar natural features were matters of life and death.

Now, however, much of the environment occupied by humans is built by humans. Houses, streets, factories, offices, towns and cities are all shaped by people. Once built, they begin to affect the people. The layout of our houses and apartments, the way we assign space to different uses, the walls and fences we build—all can and do have human consequences.

This aspect of environment is probably the most important one in today’s world, more important in our daily lives than the “primary” environment provided by nature. In this section we’ll investigate this “secondary” habitat.

Technology as a Part of Environment

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 and Comanche began using them, completely changing how they hunted and fought. The horses were a new tool.

- In the American south, about 200 years ago, the cotton gin replaced slow, difficult removal of cotton 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 parts of United States history. Check the table on the next page.
<table>
<thead>
<tr>
<th>Year</th>
<th>1800</th>
<th>1831</th>
<th>1859</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bales of cotton produced</td>
<td>73,000</td>
<td>805,000</td>
<td>4,541,000</td>
</tr>
<tr>
<td>Estimated slave population</td>
<td>895,000</td>
<td>2,050,000</td>
<td>3,950,000</td>
</tr>
<tr>
<td>Estimated price of good field slave, New Orleans</td>
<td>$ 500</td>
<td>$ 950</td>
<td>$ 1,700</td>
</tr>
</tbody>
</table>

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 continue into our future.

**Investigation: Stirrups and the Rise of Feudalism**

Before the Middle Ages in Europe, all armies fought on foot. Horses and other animals hauled wagons when the armies traveled, but the horses stayed behind when the fighting began. The invention of the stirrup changed that. The change was so significant that it helped bring 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 battleaxe
- Advances in animal husbandry and breeding
Investigation: City Design and Behavior

Urban expert and author Jane Jacobs wrote some important books about city environments and their effects on the patterns of action of residents. The information below is from her first book, *The Death and Life of Great American Cities.*

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. . .

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.

(Continued)

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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 1950s 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 effect on the people that use them.*

**Investigation: Apartment Environment and Crime**

Researchers made a detailed study of two apartment complexes across the street from each other in New York City.\(^4\) Each housed about the same number of people. The racial mix and the income levels in the two apartment complexes were about the same. However, one complex had almost twice as much crime as the other.

One was older, with six-story buildings built near the street. Viewed from the sky, these older buildings were “X” shaped, and the entrances were at the center of the X. The other complex had 14-story “slab-shaped” buildings, located back from the street in a park-like area. Hallways of the two buildings are shown in the figures on the next page.

Sketch the hallways in your journal, and indicate where and when the residents were likely to see and interact with each other.

Indicate which of the two apartment complexes you believe has the lower crime rate. Give reasons for your answer.
Investigation: Modifying Your Environment

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. Don’t hurry. This deals with important ideas, and doing a good job will take time and effort.

Step 1  Work with a few others, and 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.

Step 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.

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

Investigation: Target Area Environment

Step 1  Within your Target Area, select a familiar, small-scale physical environment (a room, a part of a room, etc.)

Step 2  Describe in detail its configuration/organization/arrangement. Feel free to use diagrams, sketches, measurements, photographs, etc.

Step 3  Explain how the described environment appears to affect the individuals within it in some subtle, generally-unnnoticed way.

Step 4  Design an alternative shape for the area you’ve studied which you think would have beneficial effects, and explain it.

Avoid:

- Defining “environment” more in terms of “atmosphere” or “ambience” than as a specifically-shaped physical space.
- Selecting a too-large or too-small area.
- Failing to show a cause-effect relationship between environment and behavior.
- Being vague.
- Getting off the subject.
- Describing the obvious.
Part Six
Investigations of Patterns of Action

Some patterns are of major importance, some are not. You’ll look at the importance of various patterns in this section.

Investigation: Patterns of Conversation

Patterns that aren’t ordinarily important can become important when people from two different societies meet. Consider, for example, the traditional conversational patterns followed in one part of the world.\(^5\)

In some Arab countries, the proper and polite distance for a conversation is close enough to feel the other person’s breath. Also, Arab men tend to express their feelings openly and think it’s important to act out emotions. Men may weep, shout, or gesture expressively. Arabs feel that a man who doesn’t show emotion isn’t being sincere.

Among men, the proper tone of conversation between equals is loud—a near shout. A soft tone indicates that the person speaking is weak and cannot be trusted or believed. In conversations between non-equals, however, the pattern is different. Many Arabs show respect to a sheik (or a rich foreigner) by lowering their voice and mumbling. The louder an important person speaks, the more quietly the humbler Arab tends to speak.

---

**Act out a conversation between two traditional Arabic men: a shopkeeper and someone who thinks the shopkeeper’s prices are too high.** How does acting out this conversation make you feel?

**Act out a conversation between an Arabic man and a rich foreign male, neither of whom understands the other’s patterns.** How might each feel about the other after the conversation?

**Record your observations and conclusions in your journal.**

---

Investigation: Significant Patterns in Your Target Area

The members of a society may share many different patterns of action, but not all are equally important. For example, the fact that many people wear earrings isn’t as important as the fact that, in that society, decisions are made by elderly men.

Generally, a pattern of action is important if:

- The pattern affects, in some way, almost everyone within the society.
- Adults teach the pattern to the young and expect them to follow it.
- Those who don’t follow the pattern are considered “odd,” or are the object of laughter, irritation, anger or legal action.

Below is a list of patterns followed by at least some people in your Target Area. Using the three characteristics of an important pattern, decide which of the action patterns in the list are important:

- Attending school during childhood and teenage years
- Playing team sports
- Being tattooed
- Having the same last name as your father
- Raising family food in a garden
- Being able to choose your own husband or wife
- Being personally clean
- Voting in a national election
- Using powered vehicles for transportation
- Men opening doors for women

Identify at least two other important patterns followed in your Target Area.
Investigation: Historical Changes in Manufacturing Patterns

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 all but brought an end to this kind of work. It radically changed not only the nature of the work itself but much, much else.

Charles Litchman was an ex-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:

---

**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)
Using the categories at level three on your Model (and the one in the Appendix), contrast in detail the consequences and implications of earlier and later shoe production methods, for the individuals actually engaged in the shoe making process.

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—and anything else you can think of which, directly or indirectly, might relate to the changed methods of production.

Investigation: Patterns of Mobility

Daily patterns of mobility for most Americans generally involve movement of individuals over a many-square-mile area. More often than not, this movement is by automobile, and is done alone. In the course of movement, hundreds or even thousands of other individuals may be seen, most of them strangers. Increasingly, these movements from place to place lead to interactions with mechanical or electronic devices (e.g. electronic tellers, vending machines, computer work stations, etc.). When there is direct contact with other human beings, the interactions are often of short duration (e.g. paying for lottery tickets).

In contrast, daily mobility in earlier America generally took place within a much smaller area, involved walking, was done in the company of others, and concluded with extended human interaction.

Using the categories of your Model, suggest the range of possible and probable consequences of this change in mobility patterns.

---

Investigation: Marriage Age Patterns

Your reaction thus far to our study of patterns might be, “So what?” For example, does it really make much difference if we changed from eating three times a day to two or four times?

Maybe not. However, there are patterns that are extremely important.

Using the model, consider the consequences if most Americans adopted average age $A$ for getting married. Repeat for $B$ through $E$. (Some of these patterns are followed by people elsewhere).

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>5</td>
<td>Female</td>
<td>15</td>
<td>Female</td>
<td>20</td>
</tr>
<tr>
<td>Male</td>
<td>5</td>
<td>Male</td>
<td>18</td>
<td>Male</td>
<td>50</td>
</tr>
</tbody>
</table>

Branching Out

What do you think might be little-noticed but important long term changes in your society of each of the following pattern changes in formal schooling?

- Segregation by sex
- Classes of fifteen students each, all ages mixed
- Parents rotating weekly as teachers
- Home schooling of most young people
Investigation: Actions Growing Out of Beliefs

Below are summaries of two very different sets of beliefs—one set held by Comanche Indians of the middle 1800s, and the other held by traditional Ashanti of Ghana in Africa.

**Comanche**
- Individuals are supreme and independent. In almost every respect, each man is his own boss.
- Each Comanche ought to cooperate and share.
- Men become great by becoming warriors and acquiring women and horses. Women are valuable, but are inferior to men and should be subservient to them.
- War is unavoidable.
- A good horse is almost human.

**Ashanti**
- The gods and the spirits of our ancestors are in control of the universe. In order to avoid trouble, we must maintain good relations with them. They will punish those who do wrong.
- The ancestors will punish the whole group if the group does not punish individuals who do wrong.
- The elders are official representatives of the ancestral spirits, and have some of their power.
- An oath (promise to be truthful) attracts the attention of the ancestors. If the oath-taker isn’t truthful, they will show their anger.
- Family rights are more important than individual rights.

*In which society, Ashanti or Comanche, do you think people are less likely to break important rules? Why?*

*Which society is likely to have less status difference between highest and lowest people? What makes you think so?*

*Which society would be more resistant to forces of social change? Why?*
Investigation: Puritan Beliefs

Sometime before 1690, a Boston man named Benjamin Harris put together *The New England Primer*. For about 150 years, The primer was the most widely used textbook in New England. Puritan children used it to learn the alphabet, but the Primer also tried to teach a few “big” ideas, such as what God was like, why people should behave, the purpose of life, and so on.

Below are several of the little verses for various letters of the alphabet children were expected to memorize.

<table>
<thead>
<tr>
<th>Letter</th>
<th>Verse</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>In <em>Adam’s Fall</em> We sinned all.</td>
</tr>
<tr>
<td>B</td>
<td>Thy Life to mend This <em>Book</em> Attend.</td>
</tr>
<tr>
<td>C</td>
<td>The Cat doth play And after slay.</td>
</tr>
<tr>
<td>D</td>
<td>A <em>Dog</em> will bite A <em>Toll</em> at night.</td>
</tr>
<tr>
<td>E</td>
<td>An <em>Eagle</em> flies Is out of sight.</td>
</tr>
<tr>
<td>F</td>
<td>The <em>Fool</em> Is whipt at school.</td>
</tr>
<tr>
<td>G</td>
<td>As runs the <em>Glass</em> Man’s life doth pass.</td>
</tr>
<tr>
<td>H</td>
<td>My book and <em>Heart</em> Shall never part.</td>
</tr>
<tr>
<td>K</td>
<td>Our <em>KING</em> the good No man of blood.</td>
</tr>
<tr>
<td>L</td>
<td>The Lion told The <em>Lamb</em> doth hold.</td>
</tr>
<tr>
<td>M</td>
<td>The <em>Moon</em> gives light In time of night.</td>
</tr>
<tr>
<td>N</td>
<td><em>Nightingales</em> sing In <em>Time of Spring</em>.</td>
</tr>
<tr>
<td>Q</td>
<td><em>Queen</em> Esther sues, And saves the Jews.</td>
</tr>
<tr>
<td>R</td>
<td><em>Rachel</em> doth mourn For her first-born.</td>
</tr>
<tr>
<td>S</td>
<td><em>Samuel</em> anoints Who God appoints.</td>
</tr>
<tr>
<td>T</td>
<td><em>Time</em> cuts down all Both great and small.</td>
</tr>
<tr>
<td>U</td>
<td><em>Uriah’s</em> beauteous wife Made David seek his life.</td>
</tr>
<tr>
<td>W</td>
<td><em>Whales</em> in the sea God’s voice obey.</td>
</tr>
<tr>
<td>X</td>
<td><em>Xerxes</em> the great did die, And so must you and I.</td>
</tr>
<tr>
<td>Y</td>
<td><em>Youth</em> forward slips, Death soonest slips.</td>
</tr>
<tr>
<td>Z</td>
<td>Young <em>Obadias</em>, David, Josias, All were pious.</td>
</tr>
<tr>
<td></td>
<td><em>Peter</em> denies His Lord, and cries.</td>
</tr>
</tbody>
</table>
Note: Many of the verses refer to stories in “the Book” (meaning the Bible.) For example, “Job feels the rod, yet blesses God.” You might find it interesting to look up some of the names and learn their stories.

Based on the verses, with which of the statements below do you think Puritans agreed? Disagreed?

1. God rewards good people by giving them success.
2. People who are proud of their personal appearance should be warned that they are doing wrong.
3. Not everyone has the same opinion about religion. We shouldn’t punish people who disagree with us.
4. If you treat children with gentleness and love, they will always do what is right.
5. If you do wrong, God will punish you severely.
6. It is wrong to be lazy. Everyone should work hard.
7. Young people should be given freedom to choose their own way of living.
8. It is man’s basic nature to do evil things. People must be careful at all times, or they will stop doing that which God expects.
9. How people behave at home is their own business.
10. Life is long. Take time to enjoy it.
Investigation: Immigrant Ideas

When unlike people meet, their first reactions to each other are likely to be based on differences in clothing, skin color, or way of speaking. After awhile however, such differences tend to be noticed less. Ideas, attitudes, and values become more important. This was true of immigrants to America.

Immigrants to America came from many different societies, and from different groups within those societies. The material that follows shows you just some of the ideas and ways of acting that immigrants brought with them to the United States.

Male two columns in your journal, one for immigrant ideas and one for ideas shared by present-day Americans. Read each of the data pieces, and list the ideas that fit in each column.

Example A.

In Italy I live in small town—six, seven thousand. It take not much money to live. We pay the rent once a year, only little money. We have fine garden, we live healthy, happy. I obey my mother's word, which is like the God. The people in my town, they are serious, human, good heart. We give everything to the poor. When stranger comes to us, he got always the first chair; we make all we could for him. The stranger can stay a year; he needs no money to pay for anything.

We work little bit, then we take the leisure. We love very much the music, art, poetry. We love the poetical life—poetry today, and tomorrow we take what's coming with the good patience. The way I mean is not only to read the books of the great poets—of Dante that we love more than a father, or Petrarca—but the poetry of the beautiful scenery in the country, the poetry of the music, the poetry of the friendship. Even in the small town we have band and orchestra.

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7Emily F. Robbins, "If One Speak Bad of Your Mother, How You Feel?," *Red Cross* Magazine, September 1919.
**Example B:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Message</th>
</tr>
</thead>
</table>
| November 11, 1902 | Dearest Parents,  
Please do not be angry with me for what I shall write. I write you that it is hard to live alone, so please find some girl for me. Be sure she is an honest one, for in America there is not even one single honest Polish girl. |
| December 21, 1902 | Dearest Parents,  
   I thank you kindly for your letter, for it was happy. As to the girl, although I don't know her, a friend of mine who does says that she is stately and pretty. I believe him, as well as you, my parents. Please tell me which of the sisters is to come, the older or the younger one, Aleksandra or Stanislawa. |

**Example C:**

When I was five years old I began to go to cheder. Such was my diligence that I went through the *sidur* and the Pentateuch in one winter. At six and a half, my father brought me into the famous *yeshiva* of Vilna.

The sole source of maintenance for almost all the pupils was the system of “day eating,” at the homes of some well-to-do or poorer members of the community—at a different home each day. As a rule, the *baburim* are not residents of the city where the *yeshiva* is situated. To maintain them, each is assigned to eat one day in the week in certain houses; he thus rotates through seven houses a week.

---


Example D:\textsuperscript{10}

I am a son of a Polish peasant farmer. Until ten years of age I did not know the alphabet, or, exactly speaking, I knew only the letter B. Father did not send me to school. He was always repeating: “We have grown old, and we can’t read nor write, and we live; so you, my children, will also live without knowledge.”

I said to my father that I wanted to learn from a book. And father scolded me, “And who will peel potatoes in the winter, and pasture the geese in summer?” I cried. Once, while peeling potatoes, I escaped from my father and went to an old man who knew not only how to read, but how to write well. I asked him to show me letters in the printer, and he did not refuse. I went home and thought: “It is bad! Father will probably give me a licking.” And so it was. Father showered a few strokes on me and said: “Don’t you know that, as old people say, he who knows written stuff casts himself into hell?” But I used to steal out to learn more and more frequently.

Example E:\textsuperscript{11}

For the peasant, arson is a way of getting even, and does not bring dishonor in the eyes of one’s neighbors.

A peasant whom my father scolded for having set fire to his neighbor’s buildings said, “I have set fire to his barn, but he could have and still can set fire to mine.” I have listened to the stories of many perfectly respectable farmers who tried to set fire to their enemies’ farm buildings.

\textsuperscript{10}Gazeta Swiateczna, Vol. 18, No. 31.

Example F:\textsuperscript{12}

The people believe that it is the Tsar's responsibility to govern them, and that he has no need of advice from the people. They believe that the Tsar thinks about them all the time, not even sleeping at night out of concern for them. They believe the Tsar should govern alone, for that is not only his right, it is his heavy burden to bear.

Occasionally in the past the Tsar has asked the people's advice, but when he has the people have said, “This is what we think, but do what you believe is best.”

\textsuperscript{12}N. M. Pavlov, \textit{Stenographic Report of the Peterhof Conference}, 1905.
Investigation: Native Americans and English Colonists

In 1744, Maryland and Virginia officials made an offer to nearby native American leaders. The next day, they received a counter offer from the leaders, who were heads of the “Six Nations” society. Obviously, the colonists and the natives had very different ideas about how to educate boys.

*Again, create two columns in your journal, one for “English Colonists” and the other for “Six Nations.” List the probable differences in the actual teaching patterns used by each group. (The patterns aren’t explicitly stated in the data. You’ll have to infer them.)*

We know that you highly esteem the kind of learning taught in those Colleges, and that the Maintenance of our young Men, while with you, could be very expensive to you. We are convinced that you mean to us Good by your Proposal; and we thank you heartily. But you, who are wise must know that different Nations have different Conceptions of things and you will therefore not take it amiss, if our Ideas of this kind of Education happen not to be the same as yours. We have had some Experience of it. Several of our young People were formerly brought up at the Colleges of the Northern Provinces: they were instructed in all your Sciences; but when they came back to us, they were bad Runners, ignorant of every means of living in the woods…neither fit for Hunters, Warriors, nor Counsellors, they were totally good for nothing.

We are, however, not the less oblig’d by your kind offer, tho’ we decline accepting it; and, to show our grateful Sense of it, if the Gentlemen of Virginia will send us a Dozen of their Sons, we will take Care of the Education, instruct them in all we know, and make Men of them.
Investigation: Individual Feelings and the Model

“Feelings” are part of the mental life of individuals and groups. You’re comfortable with those whose ideas fit with yours; less so with those having different beliefs and values.

Below are two lists of ways of feeling. **Devise an alternative to your learning situation's demography, environment, or patterns of action that you think would affect feelings.**

*Whenever possible, actually DO something to simulate the alternative.* (For example, move the chairs to positions which radically change the usual seating arrangement, or distribute the population on the basis of physical or other characteristics.)

<table>
<thead>
<tr>
<th>Good Feelings</th>
<th>Bad Feelings</th>
</tr>
</thead>
<tbody>
<tr>
<td>self-confident</td>
<td>isolated</td>
</tr>
<tr>
<td>secure</td>
<td>insecure</td>
</tr>
<tr>
<td>cared about and caring</td>
<td>insignificant</td>
</tr>
<tr>
<td>liked</td>
<td>powerless</td>
</tr>
<tr>
<td>significant</td>
<td>alienated</td>
</tr>
<tr>
<td>in control</td>
<td>threatened</td>
</tr>
<tr>
<td>respected</td>
<td>disliked</td>
</tr>
</tbody>
</table>

Investigation: Summarizing Ideas of People in Your Target Area

Sometimes a single shared idea creates vast patterns in a society. For example, most North Americans believe:

It’s good to be young. The best years of most people’s lives are between the ages of 18 and 35 or so.

As the “baby boomers” get older, this idea is changing, but it still results in billions of dollars being spent on cosmetics, surgery, and physical conditioning. Advertisements show happy people in the “ideal” age range, or acting like people in the ideal age range.

Besides this idea about ideal ages, there are others many Americans share—ideas that create large, important patterns of action. (Most people who study the “character” of people in dominant societies come up with between six and a dozen or so main ideas for each society.)
List the main pattern-forming ideas for your Target area. Check the idea categories in your Model (and the one in the Appendix), and look at contrasting ideas of other societies for clues to what’s important.

Other clues will be indicated by your answers to a few questions:

- What situations make almost anyone in this society angry? What shared idea or ideas cause anger when they are violated?
- What motivates people to spend a lot of money?
- When people are faced with major problems, who or what do they believe is the cause? How do they try to solve the problem?

The direct answers to the questions may not be “deep” enough to show a really fundamental shared idea. Check each answer by asking yourself “why?” then “the ‘why’ for the ‘why,’” to see if you can get an even deeper idea or belief.
Investigation: Flow-Charting Change

Societies are systems, and in systems, everything relates to everything. Turn on a water faucet, and the pressure in an entire municipal water system will be affected—not much, but affected nevertheless. Change the orbit of a body in the solar system and the orbits of all other bodies will shift. Change interest rates in an economic system and all other parts of that economy will be impacted.

Looking at changes in a system can be complicated, so it’s important to keep your investigations organized. One rather simple approach is through the use of flow charts—diagrams showing possible cause-effect relationships. A flow chart begins by identifying a change in one part of a system, and then asks, “What would logically follow as a consequence of this change?”

```
Increased population → Need for more food
```

Each new change usually becomes a cause of more changes:

```
Increased population → Need for more food → Need for more farmland
```

And so on. Each change can have more than one effect.

```
Increased population → Need for more food → Need for more farmland → ?
```

---

**Step 1**  
In your journal, copy the diagram above, and fill in additional changes that would fit logically in the “question mark” boxes.
Step 2  Choose three of the following situations (a through h below) and create flow charts that suggest possible consequences for the society of which you’re a member. Extend the chart until a change is identified that would probably change a major pattern of action or shared idea.

(If you get stuck and can’t imagine what might be a logical next step in your causal sequence, refer to your Model, or the one in the Appendix. Place its “level 3” categories, each in turn, beside the point at which you’re stuck, and ask yourself if your last entry on the flow chart might have consequences for it.)

(a)  A three degree Celsius increase in average temperature of the region of the country you know best.

(b)  A five gallon per day per individual limit on fresh water consumption.

(c)  A ten-dollar very reliable VSA (Voice Stress Analyzer), portable, about the size of a cellphone. (Voice stress analyzers indicate by a light or signal when a speaker is lying.) Assume it works face-to-face and over telephone, radio or television).

(d)  An anti-pollution law prohibiting the use of automobiles for commutes of less than a mile.

(e)  A mandatory year of public service for all at age 18 or after completion of high school.

(f)  A heavy tax on automobiles, based on the number of square feet of road surface occupied.

(g)  A law requiring all shopping malls to sell or lease the airspace over their parking lots for apartments or condominiums.

(h)  Zoning regulations allowing a return to the colonial era arrangement where people live and work in the same building.
Investigation: Complex Causation

You’ve surely enjoyed some success in identifying and diagramming apparent cause-effect relationships. There’s nothing particularly difficult in guessing that, say, the price of a resource is going to go up if it becomes more scarce, or that increases in the number of elderly will place a greater load on medical facilities.

There are, however, a couple of ideas that you may or may not have noted and illustrated on one of your flow charts. For example, effects often have more than one cause. In flow chart form:

You may have discovered, for example, that several different changes in societies may raise taxes. When an effect is due to two or more causes, this process is called “multiple causation.”

**Step 1**  Copy the diagram above, and enter three possible causes of increased air pollution.

**Step 2**  Check your flow charts from the previous investigation to see if you’ve overlooked examples of multiple causation, and add blocks and/or arrows as required.
Investigation: Feedback

Because of the systemic nature of societies, effects often “double back” and reinforce themselves (or their causes). Sometimes this is called “feedback.” (You’re no doubt familiar with feedback in public address systems. When the sound from an amplified speaker is picked up by the microphone and amplified again, and then again and again, an ear-splitting noise may result.) In flow charts, “feedback” can take many forms:

Step 1  Check the flow charts you’ve created to see if you’ve overlooked examples of feedback. Add blocks and/or arrows as needed.

The idea of feedback is extremely helpful in understanding human affairs. In everything from personal relationships to international politics, it’s a powerful force for making things better or worse. In fact, it’s likely that the process is a major contributor to the decline of civilizations.

Step 2  Convert the following into a flow chart. Show feedback.

A society that lacks trust in another society may increase its defenses. The second society, seeing the first increase its defenses, may in turn increase its defenses, making the first society even more suspicious. The two groups may go to war with each other. Even if they don’t, a not-so-rare consequence of this version of feedback is that one or both of the societies end up investing so much in defense against the other that the internal neglect does them in.

Step 3  From current world events, identify at least one example of the process you’ve just diagrammed.
Another illustration:

When the ancient Egyptians invested their surplus wealth in irrigation canals, the increased food production provided more wealth that could then be used to build more canals. The same thing appears to have happened to the Athenians, in what is now Greece. When Athenians used their trade surpluses to build more ships to expand trade, they became steadily more rich and powerful.

In your journal, describe the feedback taking place in these two societies.

Decision-makers in Egypt and Athens eventually began using wealth to build pyramids, temples, and other monuments. What effects would you expect from this change?

Which local, state, or federal government expenditures seem to you to fall into the “pyramids and temples” category, and which into “canals and trading fleets” category? Why?

Investigation: Analyzing Multiple and Cumulative Causation

Multiple and cumulative causation are important in each of the following situations. Choose one of the following changes, and identify and chart related changes.

- Reduction in tobacco use
- Price inflation
- Conflict between workers and business owners
- Increase in crime
- Redevelopment and improvement of old downtown areas
- Reduction in price of computers
Investigation: Identifying Cumulative Causal Sequences

**Step 1**  Cumulative causation affects nearly every American. *In your journal, make a large copy of the flow chart below, with space in the boxes to write in the entries shown on the next page:*

![Flow Chart](attachment:flow_chart.png)

**Step 2**  The list of city conditions below is in random order. Copy each condition on a separate slip of paper, then arrange them in the circle, with “causes” preceding “effects.” When you find a possible sequence, copy it to your journal diagram.

- Poorer downtown municipal services
- Decline in downtown business profits
- Movement of population to suburbs
- Less downtown shopping
- Lower municipal taxes
- Lower downtown property values
- Decline in downtown security and attractiveness
Investigation: Negative Feedback

Feedback doesn’t always increase change. “Negative” feedback reduces the effects of change, creating more stability. One common example is the effect of changing prices. Most merchants want to charge as much as they reasonably can for what they’re selling, but the more they charge for an item, the greater the number of people who’ll refuse to buy it, reducing sales and profits. And, if there’s a competitor nearby, the competitor will see an opportunity to sell more by pricing his item lower than the first merchant. These two effects act together to help stabilize prices.

*Diagram the process described in this paragraph, showing how negative feedback stabilizes the price system.*

*Look over the systems you’ve analyzed so far, and identify possible negative feedback loops.*

Investigation: Target Area System Change

**Step 1**  
Identify a significant change that has happened in your target area, such as new construction, gain or loss of people, addition of new equipment, or something similar. Check the Model—it will suggest the kind of changes to look for.

**Step 2**  
Diagram the causes that led to the change, and any other changes that occurred as a outgrowth of the change you selected.
Investigation: Action Pattern Stability

Chances are you’re sitting where you’ve often sat before. You probably put the same shoe on first this morning that you put on first yesterday morning, started brushing your teeth in the same part of your mouth, put the same arm first into the sleeve of a shirt or blouse.

Why? There’s a powerful human tendency to do things the way we’ve done them before. Patterns are, after all, patterns.

In many respects, this is a good thing. If we stopped and thought about such matters, we’d probably never get to work or school.

Here’s a generalization:

Patterns of action tend to be static—to stay the same.

Describe how patterns of dress for people in your age group differ from patterns of dress for an older age group. Find out how long these differences have been in place, and what patterns preceded the present patterns.

This static tendency of patterns comes from internal pressures (habits and customs) and external pressures (the expectations of others that we’ll do what’s appropriate given the circumstances). We have countless laws regulating action. Much of what parents do and say to their children is designed to teach and reinforce “right” action. Prisons, mental institutions and even death threaten those whose actions fall outside accepted patterns of action. Societies will go to war to resist attempts by other societies to impose new patterns on them.
Investigation: Shared-Idea Stability

What’s true for patterns of action is also true for our shared ideas. A society’s shared beliefs and values are its most treasured possessions. Inter-group conflicts are consequences of differences in these ideas.

“The upper classes are wiser and should rule.”
“No, the upper classes exploit other classes.”

“Your ancestors did my ancestors wrong.”
“No, your ancestors did my ancestors wrong.”

“A fetus is a human baby.”
“No, a fetus is a fetus.”

“The poor are poor because they’re unmotivated.”
“No, the poor are poor because the system gives them no opportunities.”

At an individual level, feelings of discomfort, irritation, anger and fear usually accompany contact with those whose ideas about important aspects of life differ from our own. Within societies, the pressure to think “correctly” is even greater than the pressure to follow standard patterns of action. In America, for example, despite the widely-shared idea that people should think for themselves, there’s little tolerance for “socialists” or “polygamists.”

A generalization:

**Shared ideas tend to be static—tend to stay the same.**

About a century ago, the Boy Scouts of America organization was formed. It adopted an oath and law reflecting deep-seated American values and beliefs. Here is the Scout Law in brief:

A Scout is:

- Trustworthy
- Loyal
- Helpful
- Friendly
- Courteous
- Kind
- Obedient
- Cheerful
- Thrifty
- Brave
- Clean
- Reverent
Step 1 Discuss each of the 12 points of the law. Which do you think are still accepted by most Americans? Are any of them less accepted than others? Which ones? Record your conclusions in your journal.

Step 2 How do people tend to react to those (not just Scouts) who violate various of these laws? Record your conclusions.

Investigation: Change-Triggered Conflicts

The graphic below identifies a frequent cause of societal friction and conflict:

Examples:

- Static Tendency: Shared idea: "A woman’s place is in the home.
- Dynamic Tendency: Need for new tanks and planes during World War Two
- Static Tendency: Shared idea: "It's good to own lots of stuff."
These kinds of problems are difficult to solve. If a new way of acting or thinking is proposed to adapt to change, people often feel insecure, angry or frustrated. On the other hand, it’s almost impossible to stop demographic and environmental change.

**Step 1**  
One familiar American pattern of action is widespread ownership and use of automobiles. **Make an arrow diagram like those on the previous page, showing this pattern as a “static tendency.”** Then identify an environmental or demographic change that will likely result in problems or conflict with this pattern.

**Step 2**  
A deep-seated American belief is that every generation will live better than the previous generation. **Make another arrow diagram showing this as a “static tendency,” and identify an environmental or demographic change that may threaten this belief.**

**Investigation: Target Area Conflicts**  
In your Target Area, almost certainly there have been significant changes in population, environment (including technology), or both, in the past 10 years. **Identify an important change and any conflict or stress which might possibly be related.**

**Investigation: Incremental Change**  
To survive and prosper, a society must adapt to change. However, demographic and environmental changes often occur so slowly that they aren’t noticed. Or, if people **do** notice, the changes seem to be so gradual they can safely be ignored.

**Here are examples of possible incremental changes. Which, if any, apply to your own society? What are the possible long-term consequences of the changes? Choose one and make a flow chart.**

- Gradual losses of topsoil
- Long-term lowering of underground water tables
- Century-long increases or decreases in the length of the growing season

Add other possible changes to this list.
Investigation: Monitoring Change

To adapt to change, it’s important to know what’s changing. Societies need systems for monitoring long-term changes in environment and population. *In your journal, answer the following questions:*

(a) What are your society’s major sources of information about its population and environment?

(b) Do you think they’re adequate? If they’re adequate, are people paying attention? Why or why not?

(c) If you don’t consider the information sources adequate, or if people are not paying enough attention, what could be done?

Investigation: Predicting Future Change

We’ve said that technology (which we consider a part of the environment) is one of the important engines of change. Those introducing new technology rarely consider the long-term consequences. Below is a description of a possible technological change:

One way of thinking about Earth is to see it as a self-contained life support system. Air and water and other essentials of life are recycled and stored, ready to be used again. It’s a good system. If we take care of it, it seems capable of working for a very long time.

One of the research objectives of the National Aeronautics and Space Administration is the building of life-support systems. For travel away from Earth, what is needed are portable versions of Earth—systems which supply food and water, and manage waste, indefinitely. To be practical in space, a self-contained life support system has to be light in weight, very compact, and very energy efficient. However, in the much friendlier environment of Earth these factors are far less critical. The design problems for building a self-contained system to provide a continuous supply of food, water, energy and waste management are challenging but not insurmountable. (If this seems far-fetched, remember that it’s been done before. Not long ago, a great many Americans owned and operated their own self-contained life support systems. They were bulky and needed constant care, but they worked. They were called “family farms.”)

**Step 1** Design a self-contained life support system sufficient to meet the needs of four people, operable in the local climate. (No outside
connections to utilities.) Try to make it compact enough to maintain average suburban population densities.

**Step 2**  
Compute the approximate unit cost of the system.

**Step 3**  
Decide who would be the most likely buyers of such equipment and devise a multi-media marketing program, complete with roughed-in ads, etc.

**Step 4**  
Predict both the probable and possible impact of the system on local demographics, environment, ways of acting and shared ideas of reality.

**Step 5**  
Take and defend a value position on the desirability of making the equipment available and affordable.

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**Part Ten**

**Constructing New Knowledge**

Much traditional schooling is concerned with “information transfer.” You read a textbook or listen to teacher talk and try to move what you’ve read or heard into your brain and store it for future use.

The problem with this is that so much of what you’re going to need to know in the future no one yet knows. This means that you’ll, have to create new information and knowledge for yourself.

The basic process by means of which you’ll do this is the one we explored in Part One: Relationships.

You now have a fairly elaborate Model for the study of reality, one that allows you to create new knowledge by relating parts of that Model. For example:

![Diagram of Model categories and relationships]

The main Model categories relate, but the relationship isn’t always clear. Getting specific (looking for subcategory or sub-subcategory relationships) is easier and more likely to yield useful information.
Investigation: Possible Relationships

On the following pages are random examples of relationship statements you can explore.

*Choose relationship statements from each of the four main categories and discuss their applicability to the society with which you’re most familiar.*

*Using the same relationship statements, investigate their applicability in one or more societies that differ in important ways from your own.*
Environment

Explore the relationship between:

- border terrain and societal interaction
- climate and patterns of migration
- depletion of mineral resources and social class
- residential housing design and interfamily relationships
- distribution of wealth and societal productivity
- weapons cost and complexity and personal autonomy
- the content of art and intergenerational conflict
- waste sites and beliefs about worth of others
- terrain and ethnocentrism
- long-term climatic change and local economies
- resource abundance and political systems
- transport routes and xenophobia
- societal definitions of wealth and patterns of ownership
- household appliances and ideas about family roles
- symbol use and consciousness raising
- feelings of threat and growth of ideology
- waste disposal and environmental change
- climate and human anatomy and physiology
- resource scarcity and attitudes toward “otherworldliness”
- market design and buying patterns
- levels of wealth and attitudes toward children
- art and the introduction of change
- streetscape design and patterns for neighboring
People/Demography

Explore the relationship between:
- population size and institutional flexibility
- age distribution and incidence of crime
- sex ratios and patterns for courtship
- physical characteristics and disease susceptibility
- age distribution and type of health care needed
- sex ratios and ideas about work roles
- physical characteristics and rate of resource use
- age distribution and marketing strategies
- population size and individual self concept
- sex ratios and evidence of aggressive behavior
- physical appearance and mental characteristics
- population density and decision-making patterns
- age distribution and attitudes toward aging

Patterns of Action

Explore the relationship between patterns for:
- work and intra-family relationships
- styles of worship and deviant behavior
- rites of passage trauma and group allegiance
- decision making and institutional adaptability
- ownership and ideas about role
- communication strategies and organizational effectiveness
- forms of childhood play and societal values
- residency and sense of community
- sexual pairing and marital stability
- inheritance laws and societal productivity
- physical appearance and status
- tolerance of deviance and societal change
• maintaining boundaries and collective self image
• expressing emotion and styles of art
• work and ideas about individual worth
• worship and intensity of commitment to belief
• educational age grouping and rate of maturation
• worship and intensity of commitment to belief
• communicating and social class
• childhood play and perception of adult roles
• status and life expectancy
• educating and school design
• mass communication and personal autonomy
• ethnocentrism and communication technology
• expressing emotion and physical health

**Shared Ideas**

Explore the relationship between societal ideas about:

• the supernatural and amenability to change
• causation and the nature of scientific effort
• time and conceptions of the good life
• territoriality and aggressive behavior
• ideas about “self” and patterns for health care
• significant others and societal stability
• success and types of available natural resources
• the meaning of life and the organization of the economy
• the future and intergenerational attitudes
• the attributes of supernatural beings and political forms
• causation and psychic stress
• time and inter-societal misunderstanding
• personal space and self concept
• nature of self and methods of social control
• friendship and population densities
• the “good life” and child-rearing patterns
• the future and demographic trends
• the supernatural and inter-societal interaction
• causation and societal reaction to deviance
• time segmentation and patterns for work
• ownership of territory and perceived status
• value of the individual self and political institutions
• significant others and the design of living spaces
• the nature of success and longevity
Appendix: A Version of the Model

Levels of generality:

1

2

3

4, 5, etc.

People/Demography

- Sub-Groups
- Demographics
- Geographics
- Climate
- Resources
- Constructions
- Wealth
- Tools
- Art
- Symbols
- Clothing
- Other Societies
- Waste
- Alien Organisms/Substances

Environment

- Functional
- Ethnic
- Sub-Cultural
- Population
- Density
- Rural/Urban Ratio
- etc.

Society

- Working
- Worshiping
- Educating
- Making Decisions
- Owning
- Communicating
- Playing
- Residing
- Maintaining Members
- Distributing/Exchanging Wealth
- Acquiring/Displaying Status
- Maintaining Boundaries
- Expressing Emotion
- Social Service
- Socializing
- Mobility
- Expressing Creativity
- Special Days
- Maintaining Environment

Patterns of Action (for)

- Status
- Physical Reality
- The Supernatural
- Causation
- Beauty
- Time
- Space
- The Individual
- Others
- Symbols
- The Good Life
- Owning
- Acceptable Action
- Purpose of Existence
- Future
- Human Nature

Shared Ideas (about)
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