

# **Terra-trans-forma: A Simulation Game of the Changing Earth (A History of the World Revisited)**

## **Introduction**

The Game of **Terra-trans-forma** invites you and your student audience to replay human evolution as an interaction between ecosystems and cultures, populations and resources, technology and exploitation. The Game provides you with six model groups. Each one is an example of a culture at a different stage of adaptation to an imaginary environment that provides a wide variety of ecosystems: desert, mountains, forests, grasslands, seacoast, and river systems. It is up to participants to decide how to use the skills and technology to adapt to or exploit a portion of the landmass named TerraTransForma or TTF.

The key goal is to introduce groups to varied human levels of technology relevant to hunters/foragers/gatherers, herders/nomads, farmers/agriculturists, industrialists/merchants, futurists/networkers, and super-tekkies. All but one of the groups mimics the actual peoples who evolved on the planet Earth across many eons. They slowly but surely covered the entire planet with settlements (thus mimicking actual history), even in unlikely and seemingly inhospitable climate zone. How the earth is used is up to the players, and it is interesting to watch if they become sensitive keepers of the environment's health or aggressive exploiters of resources and landscape.

The game evolves through interpretation of the descriptions given each group about their roles and capabilities, and shifts in a second round to all groups trying to use the same territories.

Discovering how these groups interact, and which ones are likely to come out as dominant to the others encourages debate and reflection on the human adjustment to use and abuse of natural resources. It is expected that players will begin to understand the many problems that faced people in days of yore when technologies depended a great deal more than now on relationship to plants and animal life, weather and resources.

As technology has expanded and industrialization developed, particularly now with electronic inventions and applications, dominance and exploitation of resources is much easier and people are less directly aware of natural changes that occur. We have reached a point where human industry is capable of changing the planet's climate, changing entire ecosystems, stripping out valuable minerals, energy sources, depleting food sources, and polluting air, water, and lands with garbage and gases. Technology also supplies us with ample means to identify our misuse of the environment and, in some cases, ways to improve conditions.

Thus, players have a chance to adopt traditional ways people have adapted to earth by hunting, foraging, and herding, as well as much higher technological skill levels growing out of industrialization. The game provides a review of historical developments as well as openings to future possibilities that include current electronic creativity all the way to potential travel to other planets and outer space. Star adventure is a wonderful human

fantasy of escape and power in contrast to the much more earthbound roles taking care of farms, forests, and livestock, or oiling your machinery.

Playing the game should always be followed by a 'debriefing' conversation.

Representatives of each group offer the other groups conclusions drawn from their experience as hunters or tekkies, working separately and together with other groups. For a finale, contributors should be asked to reflect on the direction of the planet as a whole, rendering judgment on the potential for progress or disaster, or a mixed outcome of wins, draws, and losses.

Will our skills continue to increase? Will our power of exploitation expand? Will we use new technologies to conserve or consume? Will the generations to come be better off or worse off than now, and in which sectors, e.g., health, air quality, clean water supplies, plentiful food, and the conservation and reconstruction of beautiful landscapes

### **Rules of Play**

Randomly assign participants to one of the following groups: hunters/gatherers/foragers, herders/nomads, farmers/agriculturalists, industrialists/merchants, futurists/networkers, or super-'tekkies'.

Ask or give each group to introduce themselves to each other and then read the description of the group they will represent. Hand out maps of Sequencia for study and discussion.

Discuss the map of Sequencia, noting its great variety of environments: desert, mountains, forests, grasslands, seacoast, and river systems. Ask for interpretations of the territory, noting what might be advantages of living in one area or another, e.g., resources, climate, potential foods, ease of travel and transport, protection, etc.

Ask each group to choose of symbol for their group. They will use this symbol later to indicate which areas of TerraTransForma they will claim as their first choice. Have extra maps available for marking by groups, and have extra maps available for round two.

Note that there are two rounds of map making, the first where each group takes care of their own needs and makes their maps of the areas they want to live in; the second where all of the groups share maps and try to reach a decision about all living together in the region at the same time. Give students at least twenty to thirty minutes for each round to discuss and decide the following list of assignments for that round. Allow time after each round for a general discussion or ‘debriefing’ of maps and choices for settlement and use. Compare notes: put decisions on a smart board or an enlarged version of the Sequencia map, showing each group’s preferences and reasons.

**Round 1: Each group chooses its own environment.**

- a. Think about the abilities of your group to adapt to living and working together for successful survival. What are you basic survival needs? How much territory does your group need to prosper?
- b. Discuss which areas of Sequencia you will settle or wander in and provide reasons for your decisions. Note: your group may develop or use no more than a

- third of the landscape, so decide carefully which environments suit your people best. Which areas do you want most and why?
- c. Use your symbols or draw your symbols on the areas you claim, and be ready to defend your choices to the other groups. Which areas do you plan on using?
  - d. Decide how the environment you choose might change the way you live? What features of the environment might change your people the most?
  - e. Decide how you might alter or change the environment to meet your needs: what would your group's impact be on the landscape? Will you have a little, moderate, or a lot of impact? Why?
  - f. How might your group's decisions about the environment affect other groups? Can everyone living in TerraTransF share in the resources, share fairly, and share equally? Why or why not?
  - g. Share your decisions and maps with everyone in the classroom.

**Round 2: All groups try to live together.**

- a. Think about the abilities of your group to adapt and live with or near other groups. Would your technology and lifestyle be a problem to others? What if everyone has different levels of technology? Different lifestyles? Which groups will do well and which will have problems? Why?

- b. Discuss which areas on the map your group really needs most for its survival, and explain your reasons to other groups. Why are some areas better than others in making geographic choices? Are the areas that most or all would prefer. Who would be most likely to take and use them?
- c. Decide if you might or might not be willing to 'live and let live' with other groups, and explain why. How would you defend your choices?
- d. Describe how your group will develop and/or adapt to the environment, and discuss how this might change other groups. Would change be easy or difficult?
- e. Which of the groups would be most likely to have the greatest impact on the environment? Which groups might survive most successfully and why?
- f. How would each group impact other groups: which groups would be most able to defend themselves and their choices, and which would be least able? Why?
- g. What would Sequencia look like after all of the groups had settled the region: who would come out on top with the best land, the center, and who would be in the periphery? Why?

Conclude by showing Settlement and Usage Maps with a class discussion and debate on 'sequent occupation', technological and populations change. How does social, technical, and political power translate into adapting to or changing the face of the earth? How does changing the earth affect neighbors? What would our use of the landscape be like if we had space travel and almost unlimited energy supplies? Would we be kinder to the earth and more caring, or go on to exploit new places until we wore out those resources?

**Round 3 (Optional): Each group reinvents themselves as organizations of Today**

Extend play if you have time by asking each group to research an organization active in the present and replay the game seeking to achieve their goals for the planet, for example, conservation, productivity, balance, conquest, or profit. Direct group players to research different organizations and work to succeed in meeting their goals and philosophy. Here are suggested organizations to research (Require notes on goals, mission statement, activities, achievements, problems, and disappointments):

- a. Greenpeace
- b. Sierra Club
- c. American Federation of Labor
- d. Exxon or Shell Oil Company
- e. U. S. Chamber of Commerce
- f. Small Business Association

Direct each group to write their own description of goals, and skills, and then develop Sequencia again to fit the needs and objectives of each organization.

**Group Role Play Guide: Descriptions of Populations and Skills****1. Hunters/Foragers/Gatherers Role**



Hunter, Gatherer, Forager people like us make use of their ecosystem by hunting wildlife, fishing, gathering plant foods, and foraging for resources. We live together in small bands or groups of 20 or 30 up to a few hundred that take advantage of what

the Earth offers. We move about a range of environments to support ourselves, living in temporary shelters. As weather changes and food sources shift ground, we move, too. Our technology is based on crafts that create tools and adornments from natural sources like stone, bone, wood, minerals, plant fibers and skins.

We hunters and gatherers live in small groups that wander over large territories. Our lifestyle is dominated by living off the land. We go hunting for wild game, and collect berries, plants, and grains, or other edibles as they migrate or grow from place to place within an environment. Hunters make spears, bows and arrows, knives, and other tools while women usually forage for nuts, berries, honey, and vegetables take care of children. We need a variety of environments to track and hunt game and often move the entire camp, including women and children to take advantage of food supplies and water. Movement tends to follow seasonal paths to exploit mature plants and to travel to places where animals congregate, especially waterways, lakes, and rivers. We make most of our own products but do trade with others for special items like flint, beads, shells, and skins.

**We live and move in harmony with the earth and its seasons.**

## 2. Herders/Nomads Role

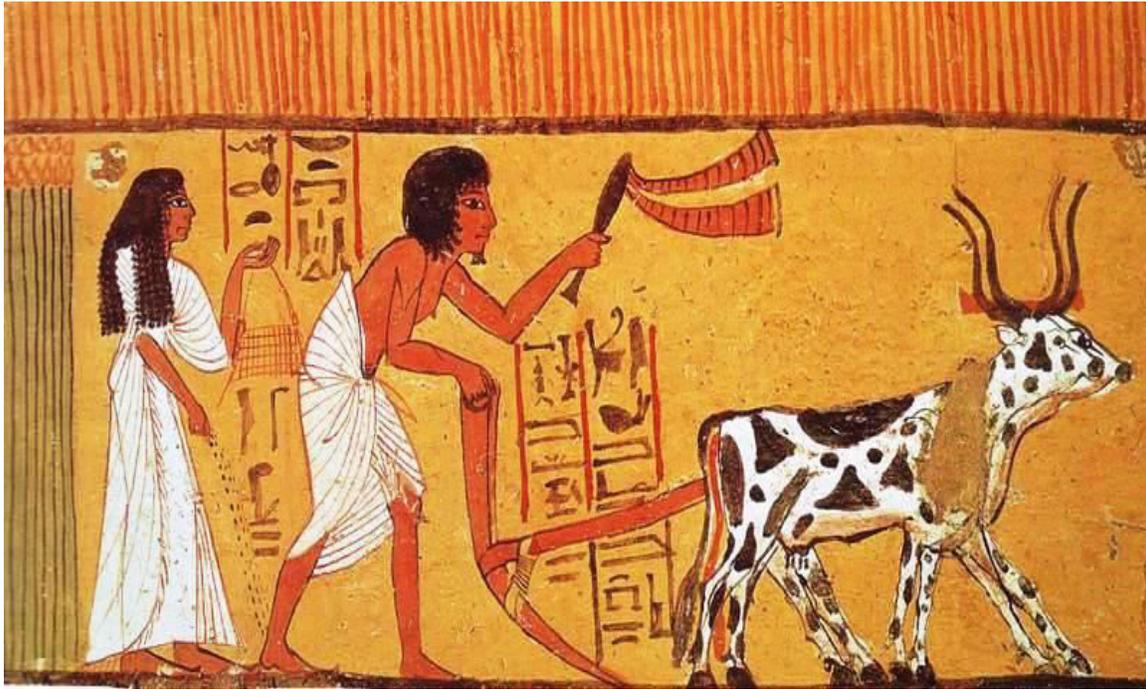


Herders/Nomads raise domesticated animals supplemented by hunting, gathering, and perhaps a bit of farming. We move around with our housing in large groups seasonally across a wide swath of territory, depending upon the availability of pastures and grasslands for their stock. We are sensitive to changes in water supplies and grasslands for our herds, which we raise in great numbers and variety for food, milk, skins, and sometimes shelter. Our groups usually number a few hundred to a few thousand depending on available grasslands for our herds, sometimes separating, sometimes joining for festivals, marriages, and other special occasions.

Our technology is based on crafts and skills using mainly animal products for clothing, housing, and food, but also wood, stone, and sometimes metalworking. We use bows and arrows, spears, and maybe guns for warfare and to protect our people. As Herders (nomads) we form traveling family groups often joining many other families when migrating to new areas for better grazing or conquest of new lands. Herding groups traverse vast areas in search of vegetation for their livestock. We like environments that are wide, open spaces giving us and the herds ease of movement seasonally. Summer is our favorite time, and we prepare for winter in the fall, joyfully welcoming spring when it arrives bringing new shoots and fields for our herds.

Don't fence us in or wall us out.

### 3. Farmers/Agriculturalists Role

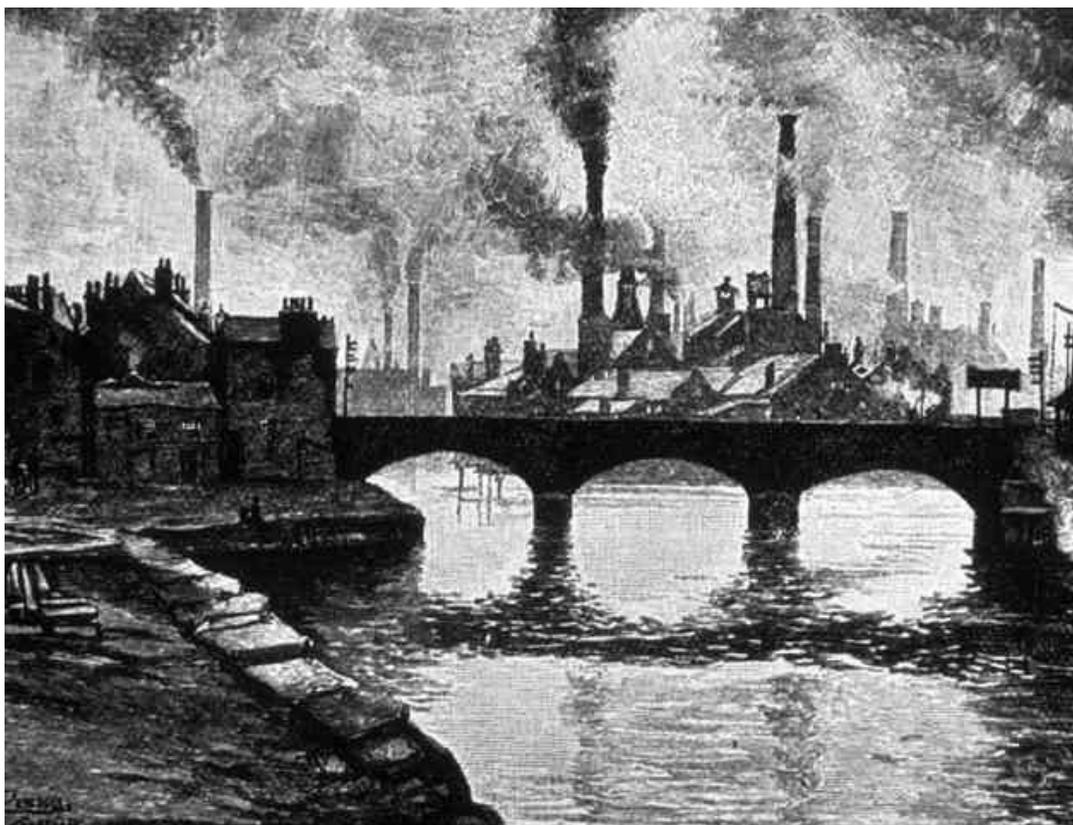


We, the Farmers/Agriculturalists make intense use of our ecosystem by planting and tending crops, supplemented by hunting, trading, and raising domesticated livestock for a variety of products and meat. Farmers may remain in one area living in villages and or scattered outside small towns. We make intensive use of water and seed resources, trying out a variety of plantings adapted to and suitable for the local climate. We prefer places with rich soil and accessible water supplies, clearing out forests and swamps for farmland. But we sometimes create irrigation systems in dry seasons, or in drier climates to water our crops, supplemented by different kinds of fertilizers.

Our technology includes pottery for carrying grains and for water or storage. We have skills of metallurgy for creating tools and implements to farm with, as well as the use of stones, bones, and wood, if available. Farmers like properties where they can grow crops easily, and frequently, and we can live in a variety of settings, usually farmsteads outside of villages and towns. Farmers may add up to hundreds to thousands of people but sometimes we live in individual or family homesteads. Crops may include intensive and/or extensive fields and orchards, livestock and ranges, grains and legumes depending upon population sizes and local demand for food. We try to take advantage of the climate and weather and provide for local people while setting aside some of our produce for export or exchange with other farming communities. Let's settle down.

If nomads or hunters disturb us we can build fences or walls to keep them out. Yeah!

#### 4. Industrialists/Merchants Role

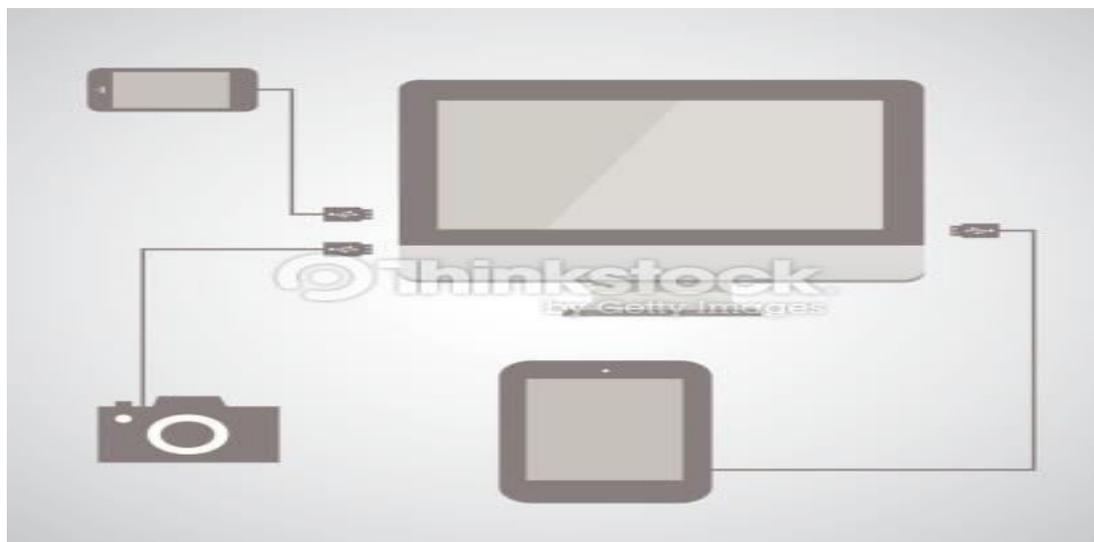


We, the Industrialists/Merchants make extensive and intensive use of our ecosystem by building business, factories, and production lines to manufacture finished goods from raw materials found locally and imported from other people. We need a lot of raw material, mineral resources, energy, and food to help us build an industrial base. We like to live in a city but travel for trade to others cities and countries to exchange goods and services. We make extensive use of communications to increase sales and production and if the funds are available we like to make civic improvements like roads and bridges, changing the face and shape of the environment if needed. We also are capable of building dams and reservoirs for drinking water and power.

We prefer to live in urban/suburban locations of hundreds of thousands up to millions of people, in places that are easily accessible for transportation and commerce. Our technology includes plastics, metals, chemicals, machinery, trains, cars, abuses and ships, as well as machine tools. We need and use fuels in huge quantities, like gas, oil, waterpower, and electricity, and we are experimenting with wind power lately. As Industrialists we build upon earlier settlements, like farms or forests, creating urban centers that direct, manage, and store wealth based on natural resources, topographic settings, waterways, strategic location, farming communities, and a history of commerce and trade relations. Sometimes to make a bigger and better profit, we overlook pollution of air, water, and earth.

We can develop almost anywhere on the earth.

### 5. Futurist/Networkers Role



We, the Futurist/Networkers, make use of our ecosystem by creating almost instant electronic communications and controls for the process of production and communication, in addition to building factories and conducting trade across the entire globe. We are experimenting with space travel, just brought back a guy from Mars, you know! We possess advanced technological capabilities to change and to shape the environment to suit our needs with powerful earthmoving equipment. And we have created a world wide Internet to instantly share knowledge and look up information. We have skills in electronics, space travel, vast transportation systems, shipping networks, industrial farming and fishing, intergovernmental institutions and communications, and international corporations. We easily manipulate and exploit mineral and other natural resources, but seem to have created global warming problems causing storms, temperature changes, and fauna and flora extinctions.

We tend to live in large megacities of millions of people, moving within and between cities and countries on business and pleasure usually by airplane and ship as well as earlier forms of transport like trains and cars, with a few buggies thrown in for nostalgia. We build huge projects, new cities, roads and bridges, and use natural resources like gas, oil, and electric power at great rates. A priority is finding fuel and water for increasingly large populations. Technology includes computers, cell phones, television, and high-speed transportation, and earth moving machines for industrial development and exploration of natural resources, exporting products and importing labor from around the globe.

We can do anything with science and cellphones.

**6. Super-Tekkies Role: Way beyond anything we know (for you to invent)**

Draw or find your own picture or maybe we won't be here anymore because we have mistreated Mother Earth so badly!

Super-Tekkies of the far future can perhaps travel by space ship to other planets, or perhaps have destroyed the planet through global warming and are back to forage what remains. Are we part of Star Trek, Star Wars, or a Dystopia of some kind.? You decide on a positive AND/OR a negative future for people adapting to and changing the ecosystem to meet their needs.

We have unlimited powers almost, at least until we wreck the environment!

Play the game again divided into 5 super advanced peoples competing for a place in the universe: would the outcome be much the same or very different from the one you experienced in playing round one and two of Sequencia? Why?

**Debriefing and wrap up discussion**

Ask a representative of each group to present its line of reasoning in choosing areas to settle and to move around. Ask if they thought of the health of the whole area in Round One or just their own needs and concerns. Go on to ask how they thought about Sequencia by the middle or end of Round Two. Did they become more ecologically conscious, more worried or understanding about how one group may affect another, or how one or more groups may affect all groups and the entire environment.

Ask each player in each group to take five minutes to write a reflection about what they learned from playing Sequencia. Did they draw any analogies between the game and the history of human beings on Earth? Did they draw any conclusions about the part played by population, technology, and communication in changing the face of the earth? What feelings and conclusions were brought out about geography's role in shaping the history of human beings, past, present, and future?

### **Environmental Assessment Survey: Seek, Settle, Stay, Move, Migrate, and Resettle: 12 Questions**

How will you, your family, your people, probably impact the area chosen for settlement? Do you think you will be able to hold, maintain, and improve the territory against all others? Does your technological level and population lend an advantage, or create future problems? Why? Do you think the area has a prosperous future? Why or why not? Use the following list of questions to review and judge the possible, probable, and certain effects of short and long-term settlement. Feel free to add questions of your own to assess environmental impact. Do the survey twice, first assessing local impact and then wider effects: from place to space to region to globe. Survey questions follow:

1. How large a population can be supported by local resources?
2. How will settlement affect fauna and flora of the area?
3. How will food supplies hold up as the population increases and expands?
4. How does the water supply support or pose problems for settlement?
5. How does the location invite or inhibit travel, transport, and trade?
6. How is air quality affected by construction, work and production activities?
7. How will waste, garbage, and materials be disposed of during and after settlement?
8. How does the location lend itself to defense, security, and protection?
9. What is the prospect for long-term settlement and improvement, and why?
10. What is the likely lifestyle (culture, customs, style, dress, happiness) for this place of settlement?
11. What if there was almost unlimited power to reshape environments: would that be likely to work for better or worse results in adapting nature to human needs? Why?
12. What kind of future do you predict for the earth based on your studies and the **Seuquencia game**? Do you see a better, healthier, future, or one beset by issues of overpopulation, industrial pollution, exploitation of the environment? Explain.

### **Concluding Activity: Oath to Mother Earth, Our Home**

In this book, we have offered a kind of geographic history of the Earth, providing a series of ‘big’ ideas with case studies and examples to support them. Both the ideas and the cases are applicable to U.S. and World/Global history as well as to economic and political courses and topics. Examples cross time and space focusing on key geographic ideas like: location, place, region, settlement and movement, ecosystem, passage, barrier, boundaries, and sequent occupation.

Throughout we have emphasized the notion that both student and teacher readers should think about the world in which we all live as HOME, as part of Mother Earth. It is our philosophy that everything we do, individually, and collectively, influences the shape and patten of development of our globe, with its limited resources. In fact, we would say that the BIG ISSUE is that humanity is altogether too inventive and organized, having discovered many ways to shape and reshape, use and overuse the resources Mother has allotted to us for our homes.

Our participation with the Earth can range from someone tossing a lighted match in a forest, or dropping their plastic water bottle in the street, to mining the tops of mountains, shifting the earth to create vast canals and dams, or accidentally spewing millions of gallons of oil into a sensitive ocean or lake environment. All of these actions are costly, and contribute to a better world, or one in which externalities are overlooked in favor of profit, personal pleasure, or simply, laziness.

New evidence shows that settling the Earth goes back more than 3 million years by Australopithicenes who may have been the first sort-of humans. We changed the Earth by

inventing tools of stone. As big inventions slowly developed, human and human type beings began to spread into every nook and cranny of the globe. Some are still exactly where they first settled. Some are trapped and dying out, or are being eradicated, or absorbed, by peoples with superior technologies. Peoples with great wealth and the most advanced technologies are literally controlling most of the globe's resources, and moving peoples around by pushing and pulling labor markets, resources, and food supplies from one area to another, or from across and between many regions simultaneously.

Sequencia the game is a model for the slow and quickening pace of technological, and population change throughout history. It is also a model for a degree of moral and ethical decision-making: whether richer and more advanced peoples will deal with lesser mortals in civilized or exploitative ways. History and geography are replete with examples of peoples who have been pushed out, captured, put on reservations, decimated, or assimilated in the name of culture, empire, power politics, business, or some other convenient rationale.

Questions were raised throughout TerraTransForma about the relations between peoples and places, and between peoples with greater and lesser economic and political power. The game mimics the great historical question of treatment of the 'others': those we see as perhaps standing in the way of progress, of being different looking and different acting than the 'superior' beings who own vast supplies of military, communication, and transport equipment, capable of literally moving mountains and reshaping the Earth. But the big question is whether or not Mother approves of the new Home being shaped by ever increasing populations, ever denser cities, and ever more exploitation of habitat.

So, how would you answer questions about shaping the landscape, about responding to new innovations, about choosing to conserve or exploit? If we create an “Oath” to Mother Earth, what would you want that promise to look like? How would you react?

**Think about the questions below and debate the Oath that follows (being free to hold a conference, constitutional convention, or just business meeting to decide on the exact wording for a document all or most would be willing to sign on to in respect to Mother and Home.**

Would you be willing to sign and act upon the following Oath?

Would you be willing to rewrite the Oath to improve it or give it a better direction?

Would you be willing to attack the Oath and explain why you reject it?

Would you be willing to act on the Oath: carry out its promises? Why or why not?

What would the world look like 20 years from now if the Oath is accepted, acted upon, or rejected?

Write a 100-word essay about the likely causes and effects of the Oath below on everyday behavior and action in our society, or create an Oath of your own on the global ecosystem. Poll friends, classmates, and strangers to find out how many will or won't sign and support an oath to Mother Earth, and for what reasons pro or con

## OATH TO MOTHER EARTH

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As you the Earth are my Mother, and the Mother of Us All, I swear allegiance to you and promise to protect and defend you and your offspring in nature, animal, vegetable, and mineral through my personal actions, and by making responsible and caring social, political, and economic decisions that help to save, sustain, and renew the Earth's resources so we and our planet survive and prosper now and in the future. This means saving energy, controlling wastes, recycling products, making sure that production adds to rather than subtracts from the well being of the environment, even if these goals cost more money than tossing our garbage out the car window, or letting the shower run while we burn extra energy cooking dinner, or leaving the TV and computer on while we brush our teeth or take the dog for a walk.

OK? If so, Sign here \_\_\_\_\_

Make a contribution to your favorite organization. May happiness be with you!

**Hold a classroom convention and decide on the ideal place to live!**

### Conversations in the Classroom: Constructing My Ideal Settlement

Join two or three others and tell each other about where you live: city, suburb, farm, or country. Maybe you herd animals or grow crops; maybe you just keep grass alive or raise indoor plants. How would describe your relationship to nature? To your current lifestyle: do you like wide-open spaces, or dense urban environments? Why? Do you see yourself as an urbanite, suburbanite, or country dweller? Why? Where would you prefer to live in the local area, state, country, or world if you could pick your first choice? Which lifestyle do you think takes the smallest 'footprint' causing the least wear and tear on the earth? Is your first choice exactly like the place and space that you think causes the least problems or the most problems. Which is the more efficient lifestyle, urban, suburban or rural? Which is likely to be the most productive economically, socially, and in terms of overall happiness? Defend your choices with reasons that you explain to others. In a world that is globalizing and growing in population, which choices do you think are opening up for human beings and which are diminishing?

### For Enricment Reading

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