

# Using a Role-Playing Game to Teach Ecology

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**S**TUDENTS ARE OFTEN IGNORANT of the many factors involved in deciding environmental questions. With this in mind, I devised a role-playing game to make students realize the dilemmas posed in attempting to reach ecological decisions that suit everyone and to help them understand why efforts to improve the environment seem so painstakingly slow. The game has been used effectively in a class of thirty tenth-grade students; it focuses on the influence of suburban population growth on the local politics, ecology, economy, land use, and lifestyle of a small hypothetical community I call "Ecotown."

To start the game, the teacher passes out a map and the following description of the situation to each student:

Ecotown is a small community (population 9,000) that lies between Vista Ridge and the Crystal Mountains on Secondary Route 60. The town is situated on a bluff overlooking the beautiful Clearwater Creek Valley. The creek is the home of rainbow trout with salmon migrating upstream in the fall. Canoeing is possible in its clean waters for twenty miles northeast of the town where the creek becomes too shallow.

The town enjoys a modest tourist trade (fishing and camping in the summer and skiing in the winter) and serves nearby agricultural and mining areas. The population is growing slowly because few new jobs are available, and many young people leave to seek employment in larger cities. The surrounding land is privately owned as farms, campgrounds, and recreational facilities.

During the past five years, suburban communities near Excess City have expanded and moved closer to Ecotown.

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Nearby farms are being sold to developers who are planning high-density residential housing. Taxes have been increased to meet the demand for schools, sewage, and street-lighting in these suburbs.

A wealthy landowner has willed to Ecotown several thousand acres of undeveloped land along Clearwater Creek to be used "in the best interest of the people." The land is under municipal jurisdiction, and you are presently attending a meeting held by the five-member City Planning Commission to listen to proposals for the use of the land. As a citizen, you are concerned about the decision because the tourist business is dependent on the recreational use of the land.

Once the situation is understood, the class is then divided into the following groups:

1. Ecotown City Planning Commission—5 students
2. Park Avenue Citizens Civic Association—3 students
3. Wattson Electric Power Company—3 students
4. Paradise Development Corporation—3 students
5. State Highway Planning Commission—3 students
6. Grabbit Sand and Gravel Company—3 students
7. Ecotown citizens—remainder of class

Next, each group is given a sheet describing their proposal for the use of the land (see Group Assignments), and a list of arguments to convince the planning commission that their proposal is the best. At the beginning of the game, none of the groups knows the arguments or the proposals of the other groups.

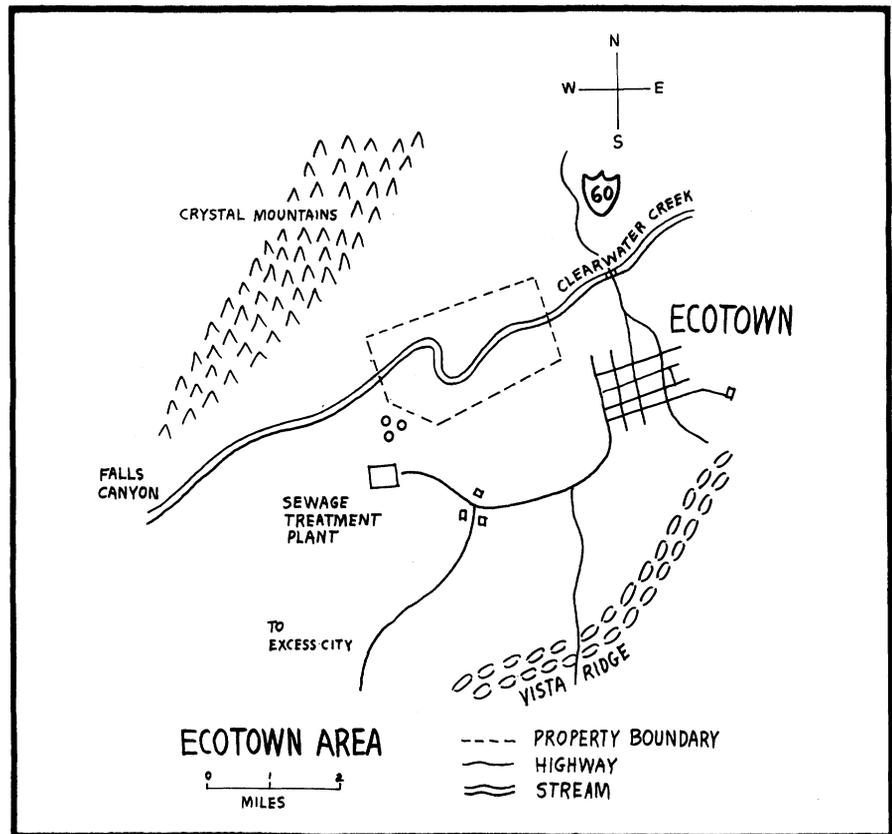
The game begins by having the chairperson of the Ecotown City Planning Commission call on a representative of the State Highway Planning Commission to present its proposal. It is important that the highway commission be called first because it will propose a four-lane highway to go through the property for which the other four groups have other plans.

Each group's objective is to convince the planning commission that its proposal is in the best interests of the people. The discussion may take from one-to-five class periods; the game ends when the planning commission accepts one of the proposals by a majority vote.

## Group Assignments

*State Highway Planning Commission:* Your objective

FIGURE 1. Map of Ecotown.



is to persuade the planning commission to grant permission to build an interstate highway out of the north through the area.

Emphasize the following points:

1. The highway, which would go to Excess City, cannot be placed to the west of Ecotown because of the additional \$24 million expense for a bridge across Falls Canyon.
2. The highway cannot be diverted to the north because of the additional \$64 million expense involved in crossing the Crystal Mountains.
3. Diverting the highway to the east means crossing the Vista Ridge twice in order to serve Excess City, at an additional cost of \$19 million.
4. The least expensive and best way to spend tax dollars is to build the highway on the municipally owned land.
5. The construction of this highway will bring additional business and prosperity to Ecotown.

*Remember:* Highway planning commissions are often criticized for their lack of efficiency. You want to get this job done as inexpensively as possible. The money saved could be used for other state projects.

Some facts you may need to persuade the commission and to counter the proposals of other groups are: (1) A power corporation has proposed a dam across Clearwater Creek. This could serve as the highway bridge at an additional savings of \$16 million; and (2) If necessary, the Highway Commission will recommend that the land be condemned and taken over by the state for the construction of the highway.

*Watson Electric Power Company:* As representatives of this utility, your objective is to persuade the planning commission to permit you to build a dam and hydro-electric power plant. Support your case with the following information:

1. The 120-foot-high dam will create a 2,000 acre lake that will increase the tourist trade of Ecotown and provide the town's population with a great recreational facility. Hundreds of tourists will want to use the lake for boating, water skiing, fishing, and other activities. The resulting prosperity will create many jobs for the town's young people.
2. The power plant will provide badly needed electricity to the expanding suburbs of Excess City and cut electricity costs to Ecotown's residents by 30%. Emphasize the latter point.
3. The plant will make it possible to expand Excess City's suburbs, and the new residents will shop in Ecotown resulting in even greater prosperity.
4. The interstate highway can cross the dam breastworks, which will reduce its cost. This will save citizen's tax dollars.

*Remember:* You represent a utility company that is under pressure to find power sources for the growing population of Excess City who are constantly increasing their consumption. You must make this power plant very attractive to the commission. You may use the following facts to make your proposal more enticing. However, these measures will cost your company more money, so do not bring them up unless you must to counteract other proposals. (1) A fish ladder can be put in to allow

migrating salmon to pass upstream; (2) A small park with boat-launching area and swimming beach can be installed above the dam at no additional cost to the town. This park would include a paved access road, parking area, and picnic tables.

An important fact you may need to counteract other proposals is the following: Development of a community on the site means that additional power will be needed to meet residents' needs. Where will it originate? A coal-burning power plant could be installed nearby, but it might pollute the air. Hydro-electric power is clean and non-polluting.

*Park Avenue Citizen's Civic Association:* As representatives of the civic association, your objective is to persuade the planning commission to use the land for a recreational community park based on the following arguments:

1. Using the land for a park will preserve its natural beauty; this beauty is what attracts tourists to Ecotown. Thus, your proposal will preserve the tourist trade.

2. Community recreation will be provided by the installation of bridle trails, stables, hiking trails, and boat and fishing docks.

3. Designating the land as parkland will ensure its preservation because state laws forbid building transportation and urban facilities on parkland.

*Remember:* You represent a group of concerned citizens who are naturalists and lovers of the outdoors. Do not let them down.

Some information you may need to counter the arguments of other groups follows:

1. The local sewage plant will serve a maximum of 14,000 people. A new plant will be needed if the population exceeds this figure.

2. Dams built for hydro-electric power silt-up fast and soon become useless impoundments. This solution is only a temporary one because dams will be obsolete in twenty years as the use of atomic power increases.

3. The valley and town are located between mountain ridges; thus, they are highly susceptible to serious air pollution from increased traffic or industry.

4. Mining stream beds causes water pollution from silt and soil erosion.

5. As developers grade for buildings, they pollute the water through soil erosion. This erosion is caused by the time lag between bulldozing the area and planting ground cover after the buildings are completed.

6. High-power tension lines mar the natural beauty of an area.

7. Dams prevent salmon from migrating upstream to spawn.

*Rabbit Sand and Gravel Company:* As representatives of this company, your objective is to persuade the planning commission to permit your company to extract the excellent gravel deposits on the south bank of Clearwater Creek. Support your case for mining these deposits with the following information:

1. Your company's operations will bring more employment and increased tax dollars to Ecotown.

2. The mining operation will provide the material necessary for building the proposed interstate highway. Without your help, the highway commission will be forced to haul materials in from the quarries in the Crystal Mountains at greater expense. Thus, your company's operations will have citizens' tax dollars.

3. It would be wrong to tie up scarce natural resources that could be used to spur the community's progress. The gravel should be removed before any further plans are made.

*Remember:* Your company's profits are based on mining and selling construction materials. Here is an ideal situation: the presence of good gravel deposits that do not have to be crushed combined with plans to build a highway that will use your products. Because you will not have to transport the gravel, you can undersell your competitors and still make a good profit. Do not let this great opportunity go to waste.

Some points you might raise to make your proposal more enticing are the following: A hydro-electric power plant has proposed a dam that would create a 2,000-acre lake and inexpensive power. Your mining operations would create a site for these facilities; thus, the town would profit by mining employment, inexpensive electricity, and a recreational lake.

*Paradise Development Corporation:* As a representative of this corporation, your objective is to persuade the planning commission to sell you the land for \$3 million so that you can (1) build a community that would provide living accommodations for 24,000 people without disturbing the natural beauty of the area; and (2) construct a four-lane highway to Excess City for easy commuting. Use the following supporting information to argue for acceptance of your proposal:

1. The new community would attract business enterprises to Ecotown.

2. The valley's natural beauty would be preserved; buildings would be situated among the trees.

3. The community would provide a market for agricultural products and thus financially benefit the area's farmers.

4. Your planned community would provide pleasant rural living conditions for the workers of Excess City.

5. Money from the sale of the land could be used for other community projects.

*Remember:* You represent a corporation that makes its profits by building and selling houses. Here you have an ideal setting for a model community. Housing sales would be quick and profitable in such a setting, and your company stands to gain huge profits and prestige. Do not lose this opportunity.

The following information will be needed to counter the other groups' proposals for the use of the land:

1. The community would be developed in such a way that access to Clearwater Creek would not be blocked.

Everyone in the community could make full use of the valley as in the past. (You may not be able to fulfill this promise, but make it anyway.)

2. The houses would be built with solar heating and natural ventilation.

3. Housing would be concentrated so that a minimum part of the land would be used for construction purposes. As much of the land as possible would be left in its natural state with hiking and bridle trails for the residents.

4. The corporation is prepared to expand the existing sewage treatment plant to handle the additional population.

*Ecotown City Planning Commission:* As a member of the planning commission, you are expected to study and make decisions regarding the use of community facilities. You oversee street maintenance, sewage treatment, library services, and other public services. You also issue building permits and review plans for new residential developments. You have been elected by the citizens to make decisions that serve their best interests. Today you are reviewing proposals for the use of the newly acquired land along Clearwater Creek. Five organizations are present with different proposals, including:

1. The State Highway Planning Commission
2. The Wattson Electric Power Company
3. The Grabbit Sand and Gravel Company
4. The Paradise Development Corporation
5. The Park Avenue Citizen's Civic Association

Numerous citizens of Ecotown are also present as this is a public meeting.

You are to listen carefully to the proposals and the discussions that follow. (Take some notes.) You may question the representatives of these organizations. When the presentations and discussions are over, you must decide which proposal is best and vote for your choice. You will need to consider all the information carefully because your vote will be remembered when you stand for re-election. Three of the five voting commissioners must decide to accept a proposal.

*Duties of the Commission Chairperson:* Your job is to direct the discussion and maintain order. You may make your own ground rules, such as setting time limits on each speaker and allowing only one person to speak at a time. Begin the game by calling on the State Highway Planning Commission.

After all of the proposals have been presented, keep the discussion going by calling on citizens or representatives who have comments to make. Use your own judgment in deciding when enough information has been presented and in calling for a vote. If the members of the commission cannot reach an agreement (three members voting for the same proposal), call for more discussion.

### Additional Pointers for Teachers

I have found that informing students that they will be graded on their participation in the discussion and

strongly hinting that the group whose proposal is accepted will receive a high grade entices students to work a little more enthusiastically in the game. A grade sheet will be needed to reflect students' efforts.

To stimulate the game further, I have statements such as the following typed up on small cards; these are distributed to the students who are not members of the various groups:

A new community means more children, which means more expenditures for new schools, playgrounds, sewage treatment, and so on. The proposed new community will do nothing but raise our taxes for something that will not benefit us directly.

The land surrounding the proposed lake will be privately owned and the lake will be inaccessible to the general public. It would become a playground for the privileged few who own property in the lake vicinity.

The proposed lake would bring business to our town and reduce taxes, not raise them. I'm all for it.

Flooding the valley would destroy its natural beauty and the real tourist attraction of Ecotown. Our main attraction is our uniqueness. If we build the dam, then we're just another stupid lake.

A four-lane highway through here would pollute the whole valley with auto exhaust fumes—not to mention the noise level. We'd look like downtown Los Angeles.

I'm tired of paying such high prices for electricity. Let's allow the power company to take the land over.

Why can't we have both the highway and the planned community? Think of all the things it will bring into the area—shopping centers, theaters, restaurants, fancy motels. We need some night life around here anyway. I want my kids to grow up in a civilized community, not some boondock town where they have nothing to do but hunt, camp, fish, and look at the scenery.

When they are used, the citizens' statements heat up the discussion a little, but this is fine. I think that when emotion appears, it means that the students are genuinely involved in the game. I would suggest that teachers devise statements in addition to these examples.

The main purpose of these statements and the arguments presented by each of the groups is to get the discussion started and teach the students some facts about ecology. Once the ice is broken, the students begin to voice their own feelings.

Getting students to voice their own views can be encouraged by carefully selecting them for their roles. When students relate to the situation, they get more involved.

You may find that the game will end differently for each class depending upon the personalities of the students. Whatever the outcome, a discussion of how ecologically sound the decision made was and whether the decision will benefit Ecotown's citizens over the long run should follow.

However, no matter what the outcome of the game, students get the idea that many factors have an impact on ecological decisions and that there are no clear-cut answers to all the problems involved.