

Green Acres

Goal: Students will understand the advantages and disadvantages of traditional farming and organic farming.

Objectives: Students will...

- Illustrate the sustainability of both traditional and organic farming.
- Simulate the production of crops.
- Understand the relationship between economics and population.

Time Required: 1 day

Standards Met: M2, M12, M14, M16

Materials (For class of 30 students working in groups of 2):

15-standard checkerboards

15-six-sided die

15-four-sided die

15-twenty-sided die (Note: four sided and twenty sided dice are available in most game stores or easily attainable over the Internet)

30-counters (paper and pencils will work fine)

480- black checkers (poker chips will also work)

480- red checkers

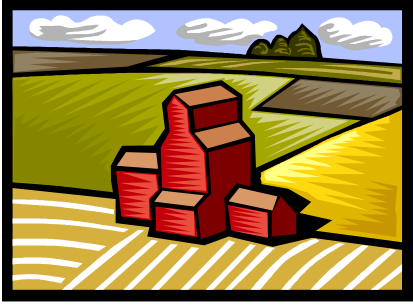
30-Student Sheets

15-sets of play money (\$100,000.00 in \$1,000 denominations)

Procedure (Rules of Play):

SETUP

- Divide the class into teams of two.
- Pass out 32 red checkers, 32 black checkers, 1 of each size dice, 2 counters, 1 checkerboard, 1 list of Fates, \$100,000 in \$1,000 denominations, and 2 Student Sheets to each group.
- Have each group designate an area for the World Bank.
- Go through the Rules of Play found on the Student Sheet with the students.
- When the game is over, or time has elapsed, have the students answer the Food for Thought questions at the end of this activity.



Green Acres – Student Sheets

HOW THE GAME IS PLAYED

1. This game is played with two players, each representing a different country (teams can be formed to include more players and to share decisions if equipment is limited).
2. Each player takes sixteen red and sixteen black checkers and places them in a pile next to their side of the checkerboard.
3. The checkerboard represents two separate countries. One half of the board (8x4 squares) represents one country.
4. Each player draws \$10,000 from the World Bank as "seed" money.
5. The starting player is determined by the highest number rolled on the 20-sided die.
6. The player that starts rolls the 6-sided die first.
7. The number that is shown represents the production capacity (in 1,000 bushels) that the country is presently able to produce.
8. Each square on the checkerboard represents one plot of agricultural land.
9. Red checkers represent farms set up using conventional (traditional) farming methods. Each red checker stands for a farm that will produce 2,000 bushels of food supplies.
10. Red checkers may be placed only on red squares.
11. Black checkers represent farms that are using strictly organic methods of agriculture.
12. Because organic farming does not give as high of yield as traditional farming, each black checker represents a farm that can produce 1,000 bushels of food supplies.
13. Black checkers may only be placed on black squares.
14. The starting player may use any combination of red and black checkers to represent the number rolled on the 6-sided die.
15. For example, with a roll of 4, one red and two black checkers could be placed on the board (country).

Sustainable Agriculture

16. The starting player then rolls the 4-sided die. Whatever number appears on this die is the population increase (in 1,000) that needs to be fed.
17. They enter that number on their counter (or paper). This number will increase every turn.
18. It is important to keep an accurate account of the population of the country.
19. For ease of calculation, each person needs 1 bushel of food to subsist.
20. If a 3 is rolled, that means that your country needs 3,000 bushels of food to meet the needs of the increase in population.
21. If you had rolled a 4 previously, you will have no problem feeding your people. In fact, you have a 1,000 bushel surplus!
22. If your first roll was less than three, you will have to import food to feed your people.
23. The cost of importing food is \$1.00/bushel.
24. If your first roll was a 2, you would have to pay the World Bank \$1,000 to feed your increasing population.
25. You do not receive any checkers with this transaction.
26. If you have a surplus of food, you may export (sell it) to the World Bank.
27. Black checkers -- organic (1,000 bushels) sell for \$2,000 because of the demand for organic foods on the world market.
28. Red checkers -- traditional (2,000 bushels) sell for \$1,000 on the open market.
29. If any sales are made, the amount of the transaction is given to the seller from the World Bank, and the checker(s) are removed from the board.
30. After the first two dice are rolled and all imports and exports are finished, the first player rolls the 20-sided Fate die.
31. The number that appears on this die corresponds to one of twenty different Fates (see list below).
32. The player must follow whatever Fate he or she has rolled.
33. If at the end of the Fate roll the player has less food available than what is necessary to feed their population, they must pay to the World Bank \$2,000 for every 1,000 bushels they are short to cover health costs for poor nutrition.
34. The first player's turn is now over.
35. The second player follows the same procedure as the first player.
36. When the first player rolls for their second turn, the 6-sided die represents new farms in addition to the one they already have in production, and the 4-sided die represents an increase in population added to the number from round one.
37. The object of the game is to:
 - a. Remain sustainable as long as possible:
 - b. Maximizing your profits from exports,
 - c. Minimizing your imports, and
 - d. Keeping your food supplies high enough to eliminate paying any health costs.
38. The game ends when one country goes bankrupt. The winner is the remaining country.

Fates

1. Better irrigation techniques, add one farm your choice.
2. More land open for farming, add two farms your choice.
3. Labor shortage, remove one organic farm.
4. Energy crisis, remove one traditional farm.
5. Healthy soils preserve water, add one organic farm.
6. New pesticide eliminates locust plague, add one traditional farm.
7. No toxic chemical spills, add one organic farm.
8. Mass production saves money, add one traditional farm.
9. Recycling of composted materials save resources, add one organic farm.
10. New herbicides increases production, add one traditional farm.
11. Smaller yields, remove one organic farm.
12. Monocultures promote pest outbreaks, remove one traditional farm.
13. Improper use of manure pollutes water, remove one organic farm.
14. Pesticides kill beneficial organisms, remove one traditional farm.
15. Terracing and crop rotation slow productivity, remove one organic farm.
16. Over use of nitrogen fertilizers contaminate water, remove one traditional farm.
17. Sludge contained heavy metals, remove one organic farm.
18. Erosion lowers yields, remove one traditional farm.
19. Increase in natural pest predators increases yield, add one organic farm.
20. Corporate farms share equipment and supplies, add one traditional farm.

Food for Thought

1. What is the advantage of selecting organic farms? Traditional farms? What are the disadvantages of each?

2. Why do you think organic farms produce fewer products per agricultural plot?

3. Why do you think foods produced on an organic farm sell for a higher price on the world market than those produced using traditional farming techniques.

4. What factor will eventually cause both countries to go bankrupt?
What could be done to stop this from happening?

5. How do you think advances in biotechnology would affect the outcome of this game?