AGRISCIENCE EXERCISE

Problem Solving/Stream Study

Key Concepts: Creative Problem Solving

Agricultural Application: Affect of Farming and Industry on the Water Shed and Related Wildlife

Exercise: Clear Creek Scenarios

Applied Principle(s): Water Quality, Ground Water Flow, Wildlife Management

Goals:

1. To develop problem solving skills.
2. To increase awareness of man's impact on the environment
3. To learn to work together toward a common goal
4. To develop the skills needed to complete a stream study

Materials:

- Scenario cards
- Creative Problem Solving by Treffinger, Isaksen, and Dorval

Teacher Preparation Notes:

▸Familiarize yourself with the problem solving techniques in the Creative Problem Solving book, or any other source which you find acceptable. Either teach the concepts to your class as they are presented, or revise them to suit your classroom.

▸This activity was developed with the eighth grader in mind, but you may adapt it to fit the age group you are working with.

▸Allow the students to work independently on this project. You may give them activity sheets for finding the velocity and discharge of the stream. Students working on the wildlife conservation might want wildlife inventory sheets. Water quality test kits should be made available for whoever might want them.

‣Allow five days for this activity.

Day one - Pass out the scenario cards to the groups. Have them share the cards with the entire class. Let the groups meet for at least two hours to begin the problem solving process.

Day two - Give the students at least two hours in the library and the computer lab(if available) so that they may do background research on their problem.

Day three - A field trip to “Clear Creek.” Allow the students to do whatever research they feel is needed at the actual site. If a stream is not available, or a field trip is not possible, try setting up a stream table in your room or providing data to the questions they ask you.

Day four - Let the students work in their groups again to write reports and finalize their solutions.

Day five - Hold meetings between the various groups, using a town meeting format.

Procedures for Conducting the Activity:

1. Divide the class into groups of four to five students, and give each group a data sheet and the necessary materials for this exercise.

2. Instruct the students to complete the activity as directed on their data sheets. You may wish to monitor their progress as they work; however, it is suggested that the students be left to follow the instructions and complete the activity on their own.

3. On the final day of the activity, invite the parents to come and view the meetings between the various groups. Ask a group of parents to be your bankers, and provide them with questions to ask the various student groups. At the end of the meetings hold an election, with the parents and students participating, to decide the fate of the property along Clear Creek.

AGRISCIENCE EXERCISE

Clear Creek Scenarios

STUDENT DATA SHEET

1. Your instructor will give you a scenario card. Read your card and with your group list as many messes as you can find.

2. Establish a broad, general goal for problem solving.

3. Examine many details of your mess. Concentrate on looking at the problem from many viewpoints. (Remember, you will need to convince others that you are the one who is right!) List the data which you will need to collect to prove your case.

4. Determine what information is the most important to obtain.

5. Consider many different problem statements.

6. Construct your specific problem statement.

7. Produce many, varied and unusual ideas for solving your problem.

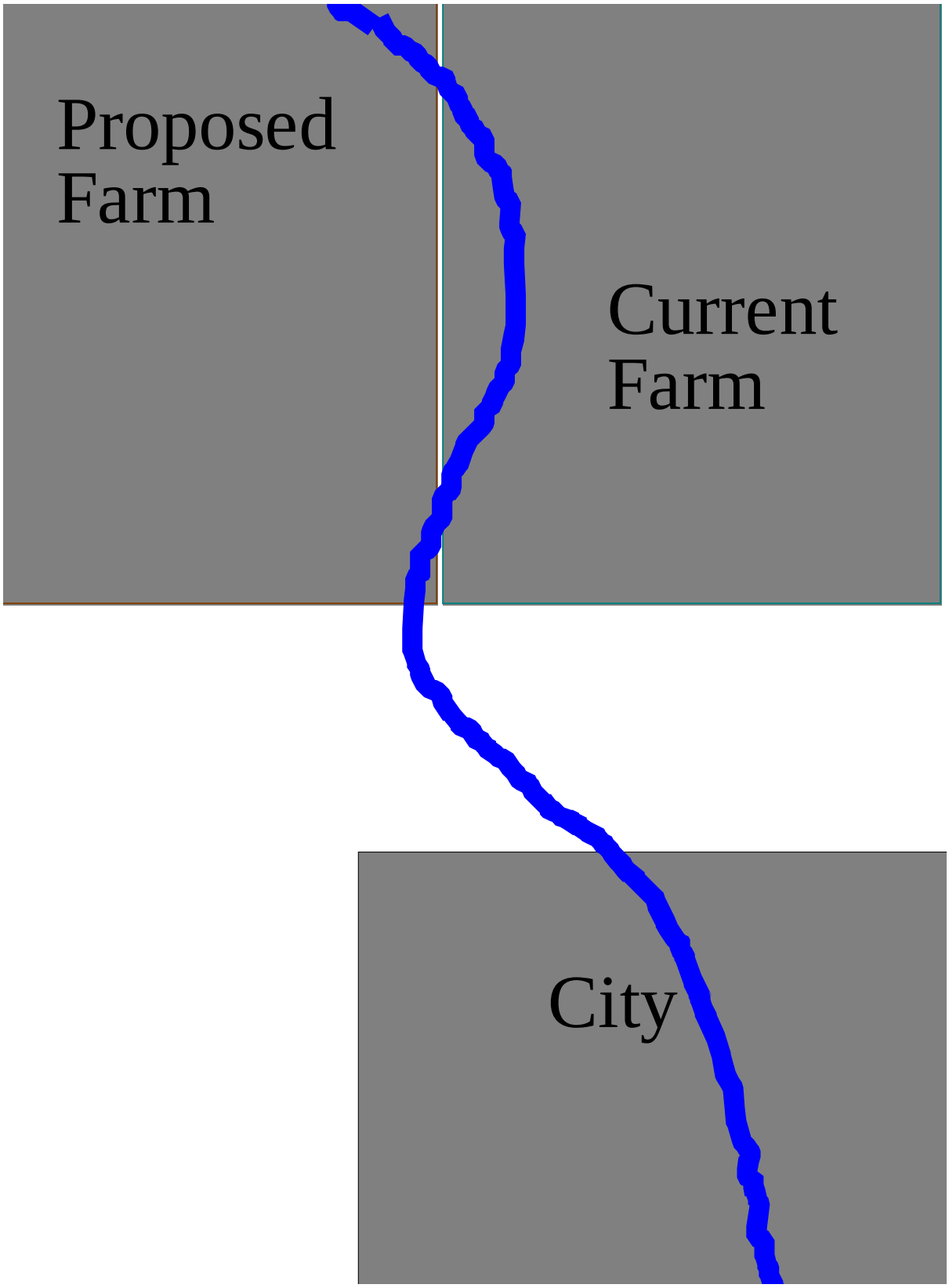
8. Identify which of these solutions have interesting potential.

9. Develop the criteria for analyzing and refining promising possibilities.

10. Choose criteria, and apply them to strengthen, and support promising solutions. Make sure that you know what information you will need to obtain from the library, Internet, or the stream site to back up your solutions.

11. Consider possible sources of Assistance/Resistance and possible actions for implementation.

12. Formulate a specific plan of action.


Proposed
Farm
Current
Farm
City

Scenario Card 1

You own the current farm along Clear Creek. The city planners are worried about the quality of the water coming out of your farm and to the city by way of the creek. Some of the people in the city are trying to say that your hog farming operation should be limited and that you should not be able to spread manure on the fields where you are raising corn. You feel that they should not have a say in your farming operations. After all, the farm you have has been in your family for more than one hundred years. Provide real data about the quality of the water entering and leaving the farm. Make a case as to why you should be able to continue farming the way you want to.

Scenario Card 2

You own the site of the proposed farm. Both the city planners and the environmentalists want to see the land stay fallow. You want to build some chicken houses and raise fryers. How can you assure that the quality of the water going to the city will not be lowered by the building of your farm? The environmentalists are concerned about the rare brown spotted toad that resides on your land. It is an endangered species and needs to be protected. How can you have a farm and protect the native habitat for the toad?

Scenario Card 3

You are the environmental group that is trying to protect the rare and endangered brown spotted toad. This is one of only five places in the country where this particular species live. It is suspected that this site is where over half of the remaining toads reside. You have not been able to raise the money to buy the land yourselves. What can you do to spot the potentially harmful effect of the proposed and current farm on the habitat of the toad? What should you do about future development of the city in regard to the protection of the toad? Your case may be stronger if other wildlife was also considered.

Scenario Card 4

You are the city council. The city council is very concerned about the farming going on upstream of the city. Not only are you worried about water quality, but if more farming occurs what will happen to the amount of water coming into the city? How long will a clean supply of water be available to the residents? What steps do you need to take in the disposal of waste water? If the environmentalists have their way, future farming will be stopped. What effect will this have on the availability and cost of food in the city? What effect will the lack of farming have on employment in your city?